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ANNUAL REPORT

WHITE PINE BLISTER RUST CONTROL

NORTHEASTERN REGION

1949

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WHITE PINE BLISTER RUST CONTROL IN NORTHEASTERN REGION

ANNUAL REPORT FOR 1949

United States Department of Agriculture
Agricultural Research Administration
Bureau of Entomology and Plant Quarantine
Division of Plant Disease Control
206 Federal Building
Cambridge 39, Massachusetts

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ACTIVITIES AND ACCOMPLISHMENTS IN NORTHEASTERN REGION DURING 1949

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WHITE PINE BLISTER RUST CONTROL IN THE NORTHEASTERN REGION
ANNUAL REPORT FOR 1949

HIGHLIGHTS OF 1949

1. For the third time (1935, 1936 and 1949) in the 32 years of the control program in this region the area cleared of ribes exceeded one million acres. Total of 1,010,688 acres worked in 1949 was 4.4% greater than preceding year although 16.8% fewer man days were used.
2. Further improvement in crew methods resulted in increase in acreage output per man day. Average of 29.0 acres per man day for all work in 1949 was 5.9 acres per man day more than in 1948, or an increase of 25.5%. Ribes averaged 3.9 per acre this year as compared with 3.7 during 1948.
3. Extensive tests and demonstrations of the dragline method were made in all states with gratifying results. The method was used to advantage in many districts during this season and its use will be increased in 1950.
4. Labor was more plentiful and of better quality in 1949 than in any of the last ten years.
5. The states and local cooperators continued their excellent support of the control program. Direct aid from states and local sources totalled \$303,033. which was \$18,289. more than the combined Federal W-A.14 and W-E.14 expenditures of \$284,744.
6. Total of 491,082 acres detail mapped and an additional 1,511,054 acres examined. Compared with previous year, these acreages represent increases of 8.7% and 6.4%, respectively, although 12.1% less man days were spent on such activities during 1949.
7. A simple and inexpensive method of reproducing work copies of block maps was developed. This consists of Standard Duplicator or "Ditto" machine copies made in the regional office from a master traced from the original map in the field offices.
8. The use of 2,4,5-T as an aerial spray was tested on Ribes americanum and Ribes hirtellum. Fall checks showed complete kill of leaves but the full effect will not be known until 1950.
9. Standards were established for determining when areas are ready for the maintenance classification. These provide yardsticks or measures for weighing the results of ribes eradication and knowledge of ecological factors.
10. The first step toward reorganization of the project on the area basis was taken by combining New York and Pennsylvania as an area with William Clave as area leader.

11. A pine infection and ribes survey was made in New Jersey by the State Bureau of Entomology. A crew of two men, trained for the job by K. K. Stimson, sampled pine areas throughout the northwestern portion of the State. Very little new infection was found.

Table 1 - Summary of 1949 Ribes Eradication Work
(All Bureau-Cooperative on State and private lands)

Acreage Worked				Ribes Destroyed (Wild & Cult.)	Man Days
First	Second	Other	Total		
170.517	426.793	413.378	1,010.688	3,918,825	34,831

PART I

GENERAL STATEMENT

Introduction

On the basis of funds available and their use, the progress of control work in the Northeastern Region during 1949 was excellent. When measured against the full control needs of the region, however, the accomplishments fall far short of requirements. This is because there is a large backlog of urgent work to be done - work that has increased rapidly each year since 1938 as the result of hurricane, lumbering and fire - while funds for the work have not kept pace. The need is for a substantial increase in appropriations to provide for a balanced program under which the initial work can be completed, and the heavy load of pre-maintenance rework and maintenance work can be brought up to schedule. Since adequate cooperative funds are forthcoming from four states and a near-adequate amount from the fifth, only three fall short of the cooperator's share. The greatest shortage is in federal funds which are considerably less than those of the cooperators.

Importance of White Pine

The four million acres of white pine in the Northeastern Region account for nearly one-third of the total commercial white pine acreage in the nation. Although none of the four million acres has been under management for full timber production for any long period, it accounts for about 40% of all lumber and 65% of all softwood lumber cut in the region. Further, the cut in the Northeastern Region during the past decade is over 41% of the total national cut of white pine. Although both of these facts are impressive, neither gives the measure of white pine's importance in this region that is derived from data on the amount of pine that can be produced under management. This is conservatively estimated to be sufficient for a cut of 1½ billion board feet per year. Such a cut is more than has been made in any except one (1907) of the past 46 years for which records are available and would be double the 46-year average. Although an annual cut of this size will not be forthcoming for many years, it is certain to come in time and is therefore a real measure of the importance of the potential crop we are protecting.

In addition to the importance attached to white pine for lumber, it has a high place on the list of elements important in watershed protection. This is clearly shown in the extensive areas of natural and planted white pine used from the higher elevation water sources down to the storage reservoirs. In the past three years during which there has been abnormally low precipitation, the higher value of these timbered watersheds has been emphasized. White pine is also of proven high value in the prevention of erosion by wind and water. Clear evidence of this is found on the blow-sand areas in several states where the shifting sands have been "anchored" with plantations. And the importance of white pine for its aesthetic worth to the very large recreational business of the region is noted in every state in the many stands of pine around youth camps, summer and winter resorts, lodges, hunting camps, private camps and other recreational centers. These so-called secondary values of white pine, which are often the primary values, add much to the high lumber value of the species.

The 1948 and 1949 totals of white pine lumber production are not yet available but there is evidence that the cut in these years was considerably lower than in 1947 when 851½ million board feet were produced. There was a sharp drop in production in 1948 when demands dropped and this continued until the early summer of 1949. Increased demands then built up but at no time were there as many mills operating as in 1947. This is a highly desirable trend for there is need for a long period of greatly reduced cutting to permit at least a partial restoration of the growth-drain balance which has been completely upset by overcutting since 1938.

Pine Infection Conditions

During the heavy lumbering of the past decade a large amount of the older infection that was killing tops and entire trees was eliminated. Although heavy damage of this type to stands of pole and mature trees still exists throughout the region, there is the over-all and general impression of less damage each year. However, most of the pine in these classes has been given protection in past years so the damage showing so prominently is that of pre-control origin and therefore does not give a measure of the current pine infection problem. This is to be found chiefly in the extensive areas of reproduction that have developed in the past 10 to 20 years on logged, burned and hurricane-disturbed areas. Data on the amount of new pine infection developing in these stands is being accumulated through a continuing program of sampling started in November, 1947. By the end of 1949, there was a total of 3,573 samples with 250,986 pines examined and an over-all average of 4.4% infected. On the 11,096 infected pines there were 13,577 blister rust cankers recorded. There were 1540 plots on which no infected trees were found. This represents 43.1% of the total sample (3573 plots) and indicates a generally favorable situation for the region as a whole. Many more samples will be needed before any far-reaching conclusion will be justified.

The Control Problem

The size of the control area in the Northeastern Region changes annually due to discontinuation of areas that change to sub-standard stocking or another type, addition of new areas and those where adequate stocking has developed, and the narrowing or widening of protection strips as required. Considerable change is taking place from decreases in the protection strip width from a fixed 900 feet to widths varying from 100 to 900 feet according to the screening effect of the cover crop. All factors combined have resulted in a reduction of about 17 per cent in control area during the past decade to the present total of 11,362,554 acres. In this same period the pine area has dropped about 14 per cent to 4,057,658 at the end of 1949. Currently the control area is being reduced considerably more than the pine area as the protection strip narrowing continues. Both figures will taper off to a fairly constant level in a few years as the mapping and re-mapping are brought on schedule.

Within the region there is an additional acreage of white pine and white pine-hardwood mixtures totalling about $1\frac{1}{2}$ million acres. A portion of this, presently at too great a distance from the established districts for economical administration, will eventually be added to the working unit. A large part, however, is sub-standard in quality or quantity of pine and therefore has insufficient value to justify the cost of control.

The reworking of a very large acreage of reproduction, most of which has developed since 1938, is the major control problem of the region. Extensive lumbering for 11 years has resulted in at least 1,500,000 acres of cut-over white pine type in the control area. This added to the acreage in other white pine types that is due for a reworking, plus the protection area concerned, amount to about 6 million acres. Even at the rate of one million acres per year, this would be a 6-year job of rework only. Since there is still about $\frac{3}{4}$ of a million acres of initial work to be done and an ever-increasing amount of maintenance work, it is evident that the present program is not geared high enough to bring the entire program up to schedule. The major need for expansion of the program to adequate proportions is for increased federal funds to match cooperative funds already forthcoming in necessary amounts in all but three states.

Status of Mapping

Although mapping of the pine and control area has reached 8,679,644 acres or 76.4% of the total control area, much of it is 10 or more years old and therefore is in need of revision. This is particularly important for areas affected by the hurricane, cutting operations and fire since they were mapped. The total mapping problem, therefore, is one of completing the mapping by covering 2,682,910 acres and bringing the old maps up to date for at least four million acres. Table 35 in the Appendix gives the status of mapping by states and districts.

Status of Ribes Eradication Work

At the end of 1949, the control area was 11,362,554 acres, of which 93.7% had been worked once, 54.1% twice, and 12% three or more times. This pre-maintenance work has resulted in 42.4% qualifying for the maintenance of control classification. Table 2 shows the status of control work by land ownership classes.

Tables 35 and 36 in the Appendix give a more detailed summary by states and districts.

Table 2 - Status of Ribes Eradication Work, 1949

Land Ownership Class	Acreage of Control Area	Acreage Worked			Acreage on Main-tenance	Percentage of Control Area			
		Once	Twice	Other		Worked			On Main-tenance
						Once	Twice	Other	
State & Private	11,337,374	10,619,831	6,120,452	1,893,806	4,789,823	93.7	54.0	16.7	42.2
National Forest	8,308	8,308	6,262	4,425	5,978	100.0	75.4	53.3	72.0
National Park	16,872	16,872	16,872	8,207	16,872	100.0	100.0	48.6	100.0
Totals	11,362,554	10,645,011	6,143,586	1,906,438	4,812,673	93.7	54.1	16.8	42.4

The 170,517 acres of first working completed in 1949 is 20% of the unworked area that existed at the beginning of the year. There now remains 717,543 acres on which no work has been done. This is all on state and private lands and is distributed by States as follows:

Maine.....	180,591	acres
N.H.	116,286	"
Vt.	155,215	"
Mass.	28,785	"
N.Y.	169,649	"
Penna.	67,017	"

The maintenance area was increased in 1949 by 665,965 acres to a total of 4,812,673 acres or 42.4% of the control area. This large increase was to considerable extent the result of the establishment of maintenance standards for worked area at the beginning of the year. There still remains 5,832,338 worked acres not on maintenance of which a large part will be so classified after only examination or scout working.

Progress of the control work in the Northeastern Region during the past 32 years and the present status of the work in the region and in each state are shown graphically in Charts I, II, and III. Chart I brings out clearly the gradual reduction of the control area size as each unit is carefully mapped, the approach to completion of first working and the increasing acreage on maintenance. It particularly emphasizes the big gap of 5,832,338 acres between the area worked once and the area on maintenance which represents the heavy rework load of the

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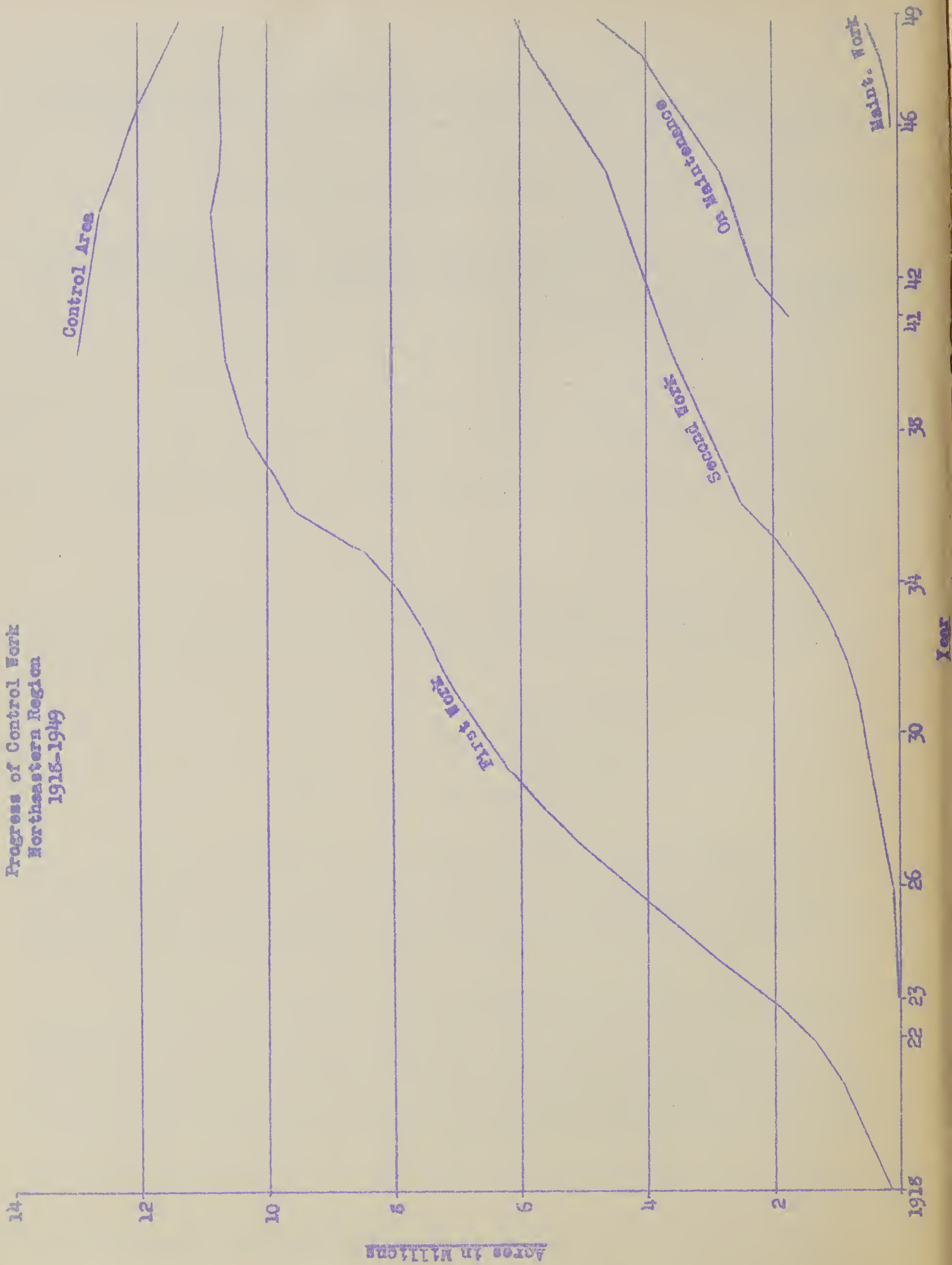
region. It also shows the increasing gap between area on maintenance and the area given maintenance workings which indicates the increase in maintenance area needing attention.

Chart II shows the status of control in each state. This brings out for each state the initial work and the rework that lies ahead.

Chart III shows the proportionate amounts of area, by counties, that still require initial work (black) and pre-maintenance rework (dark crosshatch). The area requiring only maintenance work (now in maintenance class) is indicated by the lightly shaded portions.

Chart I

Progress of Control Work
Northeastern Region
1918-1949



Status of Blister Rust Control in Northeastern Region-1949

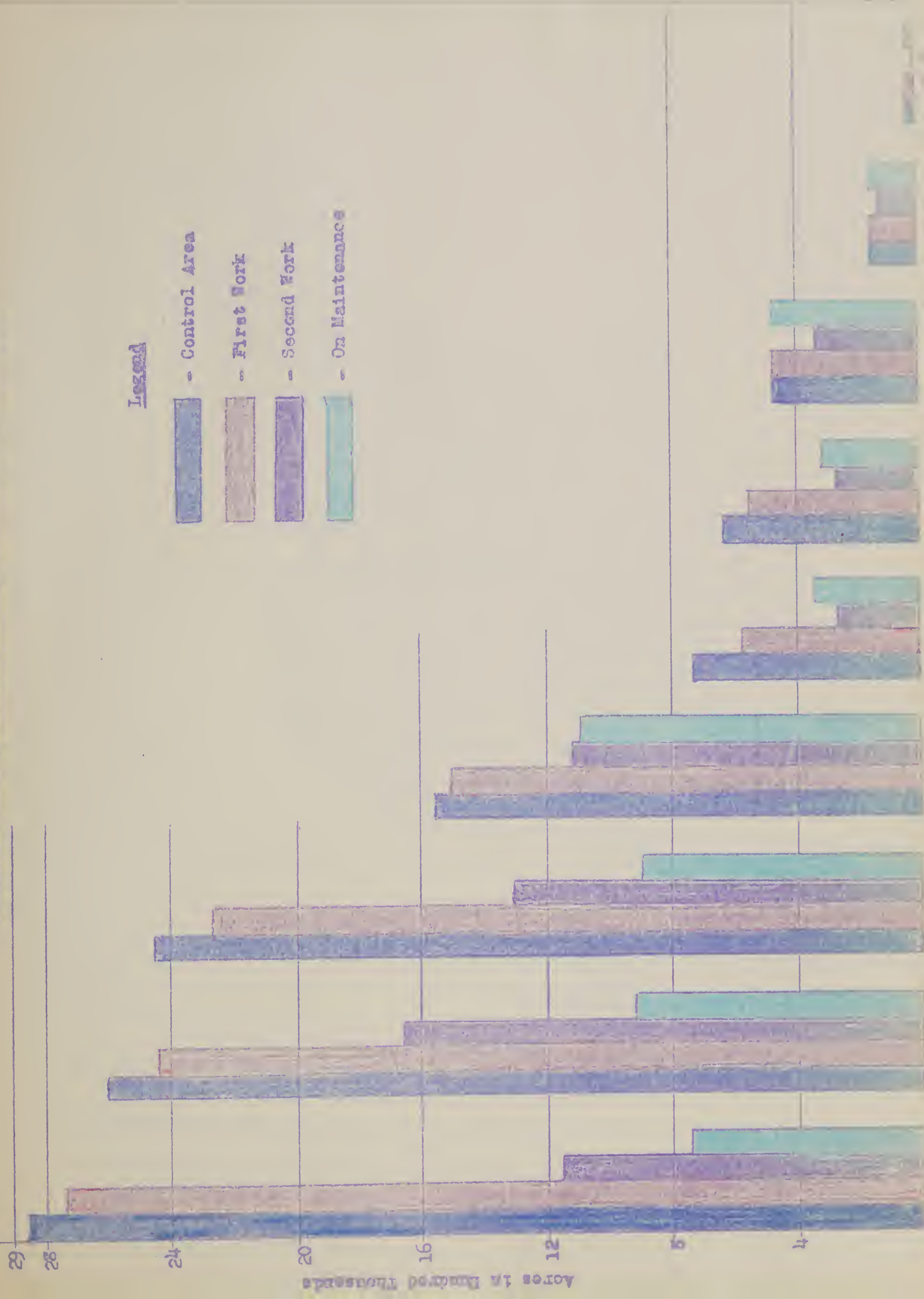


CHART III

WHITE PINE BLISTER RUST CONTROL

NORTHEASTERN REGION

STATUS DECEMBER 31, 1949.

COUNTY CONTROL AREA PERCENTAGES BY WORK CLASSES DO NOT SHOW WORK LOCATIONS



LEGEND	AREA CLASS PERCENTAGES									
	ACRES	ME.	NH.	VT.	MASS.	R.I.	CONN.	NY.	N.J.	PA.
INITIAL CONTROL REQUIRED	717,543	7	4	22	2	0	0	6	0	11
RE-EXAMINATION REQUIRED	5,832,338	57	71	37	27	0	0	59	0	39
ON MAINTENANCE	4,812,673	36	25	41	71	100	100	35	100	50

TOTAL CONTROL AREA 11,362,554 ACRES

CONTROL AREA BOUNDARY STATE LINE COUNTY LINE

Methods Development

Continuing effort to reduce control costs is an integral part of the blister rust control program. Notable accomplishments in this field have been made in the past but there is always opportunity to make further gains through more thorough training of workers, closer supervision, improved working procedures, better working tools, and other means. One of the more successful efforts in this field in recent years has been the use of more scouts and small crews of 2 or 3 men each. In 1949 this was supplemented by use of the dragline as a convenient means of marking the work strips of one or two-man crews. Demonstrations combined with tests of the dragline method were made for all district leaders by field trials in each state under K.K. Stimson. General reaction was favorable and the method was used during part of the season in some districts. Since the demonstrations were carried out from May until August, it was not possible for all districts to take advantage of the demonstration and test results for the full season. However, those districts that had the opportunity to use the method for part of the season had good results. There is no doubt that even the limited use of the method was partly responsible for the 25.5% increase in production per man day in 1949.

Tests were made of the dragline method using one man and one line, one man and two lines, and two men and two lines. The last appears to be the most satisfactory for the majority of areas in this region. One reason is that it keeps at least two men together, which is highly desirable since the 6 or 8 members of a foreman's crew are frequently split among several work sites some distance apart. It also has the advantage of giving each man assistance when needed for removal of large and difficult bushes. From the tests made thus far, it appears that the efficiency and output of the two-man unit is fully as good as that of the one-man.

Another variation in the method as originally outlined is the substitution of strip-boundary marking with string or paper by the crew as their work progresses instead of pre-marking in a separate operation. The reason for this is that the work of this region, which is over 80% rework, consists to a large extent of systematic and thorough coverage of only patches or small units scattered through or around the stands. These will run from less than one acre in a swamp, stream bottom, rocky outcrop opening, etc. to a few acres of swamp, pasture, cut-over or other type. The scout, or scout-foreman, in the course of checking the block and working the portions with very light ribes, outlines these units for crew work. If pre-marking of the boundaries is done, either he has to do it or send in another specially for the job. Thus, it is more practical to have the crew lay its boundary lines and the tests show it is more economical for the unit to lay the lines as their work progresses. This is done by throwing the cone of twine or dropping paper ahead to extend the lane boundary each time the cross strip between draglines is completed.

Tests were started in New York of the effectiveness of 2,4,5-T as an aerial spray on Ribes americanum and R. hirtellum. Both of these showed excellent preliminary results a few weeks after application but a check in 1950 is needed for final data. If this chemical is effective it will be a very valuable new weapon for the destruction of heavy and stubborn ribes populations growing with other brush and grass in swamps, grasslands and pastures and along stonewalls and roadsides. There is already an increasing use of this and other chemicals by other agencies for killing brush on power line and telephone rights of way and along some highways so the control work will be benefited by such work done in or near stands of pine. Some of this will also be of value for study of the effect of various chemicals and methods of application on ribes when the major objective is to maintain a low level of all kinds of brush.

PART II

LEADERSHIP, COORDINATION AND TECHNICAL DIRECTION OF WHITE PINE BLISTER RUST CONTROL IN THE NORTHEASTERN REGION - WORK PROJECT BLR-1-1

GENERAL STATEMENT

The leadership, coordination and technical direction of all blister rust control work in the Northeastern Region is the responsibility of the Bureau of Entomology and Plant Quarantine. In 1949 this included cooperative control work on state and private lands in the New England States, New York and Pennsylvania and scouting for the disease in New Jersey. No work was done on federal lands during the year.

The regional office at Cambridge, Mass. provides the overall project planning and coordinates the control activities into a uniform program. This involves the blending of federal, state, county, town, city and private funds into a balanced operation in which the control work is done where and when needed. In accordance with a cooperative agreement with each state, the services of technical personnel are provided by the Federal government to organize and supervise the work. In New Hampshire and Vermont a portion of the district leaders' time is spent on state forest fire work for which a proportionate share of the costs is paid from state fire funds. In each state a state employee, who is in all cases the head of the department or division responsible for blister rust control work, has nominal charge of the program and is responsible for the enforcement of pertinent state laws and policies. The states furnish office space and other facilities for federal leaders at state headquarters. Their cooperation is extended to counties, towns, cities, organizations and individuals in the accomplishment of control throughout the white pine areas of the states.

Personnel

During 1949 the permanent federal personnel on the project, totalling 42, consisted of 4 technical and 6 business employees at the regional office, one area leader, 6 state leaders, 24 district leaders or supervisors, and one field clerk. In addition, Connecticut employs one full-time district leader and New York two full-time district supervisors working under State District Foresters.

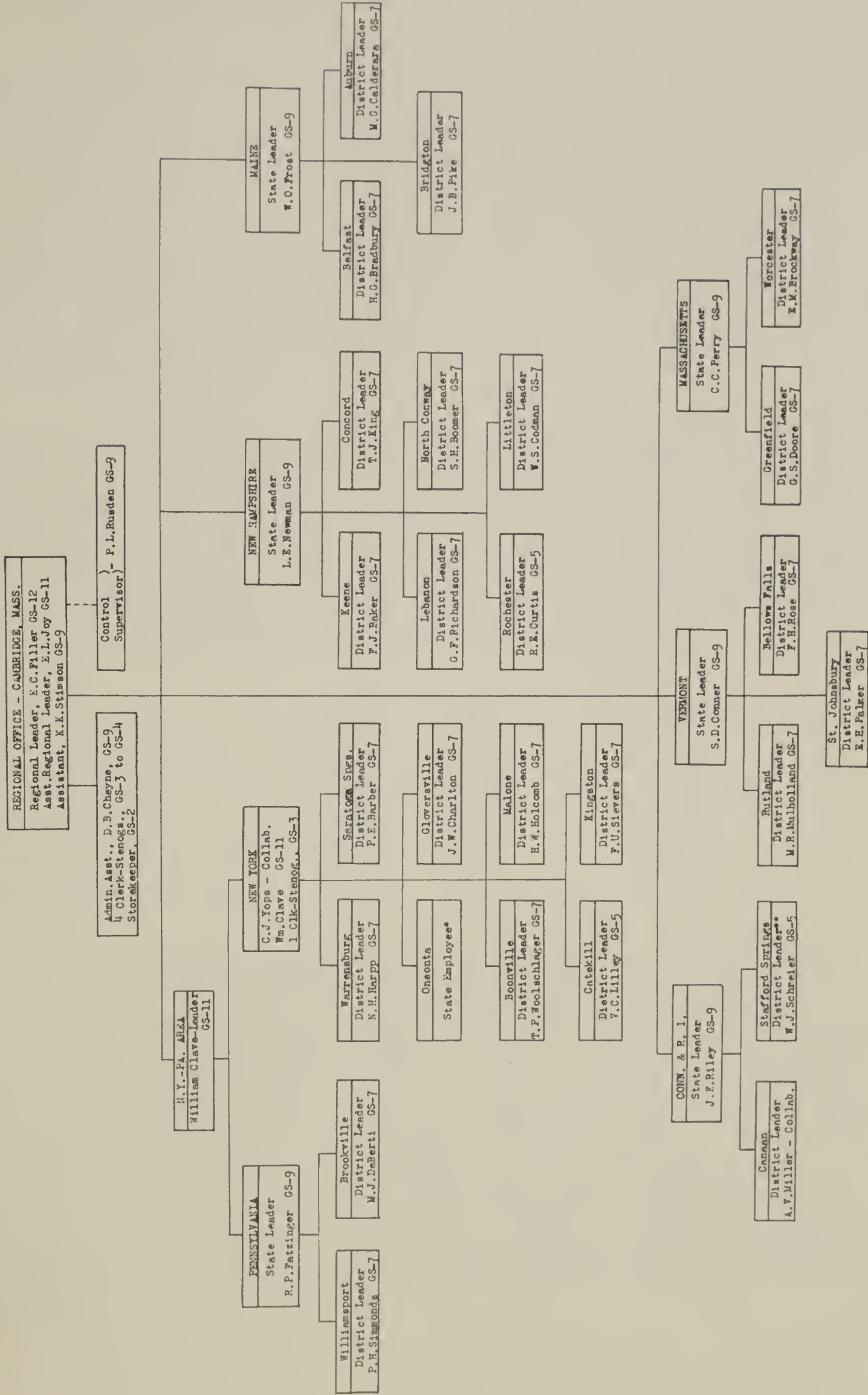
Personnel changes during 1949 consisted of the advancement of William Clave to the position of Area Leader in charge of work in New York and Pennsylvania, and the transfer of assignment of Dr. P. L. Runden from the Division in Washington to the Northeastern Region. Neither of these changes involved a change in headquarters.

Headquarters for District Leader E. M. Brockway was changed from Wakefield to Worcester, Mass. to facilitate supervision of work in Worcester County. A new office location for District Leader S.H. Boomer was established in Conway, N. H.

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One cooperator change occurred when C. J. Yops became Supervisor of the Bureau of Forest Pest Control in New York replacing William Toss who was advanced to Assistant Director of the Division of Lands and Forests.

The assignments of permanent personnel on blister rust control in the Northeastern Region are shown in the following organization chart.



*State District Forester gives general supervision to control activities in this district.

**Supervises work in eastern Connecticut district and all work in Rhode Island.

District Leaders in New Hampshire and Vermont spend a portion of their time on forest fire protection and other forestry activities.

A state foreman supervises control work in two western New York counties outside the present organized districts.

State Leader in Pennsylvania also directs control activities in Central District.

Informational and Service Activities

An important phase of the blister rust control program is the informational and service work done throughout the region to keep federal, state and local agencies and the general public informed about the disease and how it is controlled, progress being made toward its control, the work still needed to establish and maintain control, and the importance and value of the work. Although this type of activity is essential in all states of the region, it has particular significance in Maine, New Hampshire, Vermont and Connecticut where the towns assist in financing the work, and in New York where counties add their financial support. The importance of this assistance in the total program is indicated by the fact these sources provided nearly one-fourth of the direct-aid, cooperative money in 1949. A combination of these funds with the direct-aid state appropriations account for over one-half of all money expended for the program in 1949.

Compared with 1948 there was a decrease of 23.5% in meetings addressed but an increase of 41.9% in the number of people reached as 19,575 attended these gatherings. The 192 news items published gave a substantial increase of 21.5% but demonstrations placed fell off 9.9%. Both initial interviews with individuals and the related follow-up calls increased with gains of 16.7% and 16.5% respectively. The two combined represent 9,820 contacts. An additional 2,339, which represents persons instructed in the field, was 27.7% under the number in 1948. Complete data on these activities in 1949 are reported in Table 3 while the following gives a comparison for the two years:

	<u>1948</u>	<u>1949</u>	<u>% Increase or Decrease</u>
Meetings addressed.....	362	277	-23.5
Attendance at meetings.....	13,793	19,575	+41.9
News items published.....	158	192	+21.5
Demonstrations placed.....	142	128	- 9.9
Initial interviews.....	4,887	5,703	+16.7
Follow-up calls.....	3,535	4,117	+16.5
Persons instructed in the field.....	3,233	2,339	-27.7

One of the expanded phases of the informational work which is not revealed by the tabulation is the instructional work done with forestry students and practicing foresters to acquaint them with the disease and its control. During 1949, through talks, films and field demonstrations, forestry students of seven institutions were reached. These are the State College of Forestry, State Ranger School, and Paul Smith School in New York, Yale University and the State University in Connecticut, Pennsylvania State College and the University of New Hampshire. In addition, special emphasis is being given to instructional work with practicing foresters - federal, state, county, extension, etc. - in an effort to fully inform them on the identification of the disease, the identification of damage in all stages as an aid in developing management plans, the identification of ribes as the basis for their surveys in selection of white pine planting sites, the necessity for adequate and timely control work, etc.

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One unique public conservation demonstration - the complete "face-lifting" of the land of an old Massachusetts farm in one day by the Soil Conservation Service - provided the opportunity for a display on blister rust and its control. The District Leader in charge added a ribes eradication crew with ribes picks and trail paper to demonstrate control methods. This resulted in a large number of requests for further information on the disease and control work.

The material used for informational activities consists chiefly of the blister rust films, leaflets including some old copies of Misc. Pub. No. 22, and specimens collected as needed. The films are serving very satisfactorily for classroom and student-group instruction as well as for meetings of many types of organizations. A welcome addition to the printed literature is the Picture Sheet which is being used extensively. The pamphlet to replace Misc. Pub. No. 22, which was expected in 1949, is urgently needed to fill a void that now exists.

Table 3 - Summary of 1949 Informational and Service Activities of
District Blister Rust Control Leaders in Northeastern Region

Informational Activities

State	Meetings Addressed		No. Radio Talks	No. Items Published	No. Demonstrations Placed
	No.	Attendance			
Maine	19	770	-	12	10
N.H.	107	6,772	-	93	34
Vt.	44	1,994	-	18	35
Mass.	23	2,751	-	2	1
R.I.	3	11	-	-	3
Conn.	13	628	-	1	15
N.Y.	63	6,344	3	60	20
Penna.	5	305	2	6	10
All States	277	19,575	5	192	128
Average Per Leader	1949	9.6	675.0	0.2	6.6
	1948	13.4	510.9	-	5.9

Service Activities

State		No. Initial Interviews	No. Follow-up Calls	No. Individuals Instructed in Field
Maine		1,256	194	236
N.H.		1,031	1,604	657
Vt.		338	752	52
Mass.		1,355	155	47
R.I.		102	31	7
Conn.		247	117	133
N.Y.		1,190	1,000	887
Penna.		184	64	320
All States		5,703	4,117	2,339
Average Per Leader	1949	196.7	142.0	80.7
	1948	181.0	130.9	119.7

Cooperation With Other Agencies

There continued through 1949 excellent cooperative relationships between the personnel of our Division and the representatives of numerous forestry and agricultural agencies and groups throughout the region. In each state close ties are maintained with the forestry or agriculture department that has state responsibility for the blister rust control work and with the federal agency charged with the administration of federally-owned lands. Built around this is a cooperative relationship with other agencies and groups such as the Extension Service, Soil Conservation Service, forest management organizations, industry forest managers, etc. The primary objective here is to advise and assist wherever needed on the blister rust problems of timber owners, timber managers, and timber management advisors. This service is being expanded each year with marked success, particularly in connection with assistance to the state, county, Extension Service and Soil Conservation Service foresters. In a broader sense, this expansion includes the instructional work with forestry students which was carried on in seven colleges and universities in 1949.

Several of our New England leaders again assisted in the inspection for interstate shipment of decorative greens during the Christmas tree shipping season. The Division of Gypsy and Brown-Tail Moths Control at Greenfield, Mass. continued the allocation of office space for a district leader and made available dead storage space for over-winter storage of several vehicles.

Expenditures under Project BLR-1-1

The following tables summarize the expenditures of Project BLR-1-1 for 1949.

Table 4 - Total Expenditures and Contributed Services For Work Project BLR-1-1
During Calendar Year 1949

State	Value of Contributed Services By States*	B.E. and P.Q. Expenditures (W-A.14)	Total
Maine	\$2,400.00	\$18,991.78	\$21,391.78
N.H.	300.00	26,684.64	26,984.64
Vt.	666.00	17,284.78	17,950.78
Mass.	-	14,386.20	14,386.20
R.I.	120.00	83.77	203.77
Conn.	1,066.70**	5,503.74	6,570.44
N.Y.	3,000.00	40,560.65	43,560.65
Penna.	251.50	14,864.53	15,116.03
All States	\$7,804.20	\$138,360.09	\$146,164.29

*Technical services of state employees

**Includes \$200. chargeable to Project BLR-2

Table 5 - Federal W-A.14 Expenditures For Work Project BLR-1-1
During Calendar Year 1949

State	Salaries of Appointees	L/A	Leases	Purchase Orders	Total
Maine	\$18,243.78	\$400.00	\$348.00	-	\$18,991.78
N.H.	24,872.29	-	720.00	1,092.35	26,684.64
Vt.	16,843.78	441.00 ⁽¹⁾	-	-	17,284.78
Mass.	14,266.17	120.03 ⁽²⁾	-	-	14,386.20
R.I.	83.77 ⁽³⁾	-	-	-	83.77
Conn.	5,503.74	-	-	-	5,503.74
N.Y.	35,804.80	1,049.96	300.00	3,405.89	40,560.65
Penna.	14,244.53	440.00	180.00	-	14,864.53
All States	\$129,862.86	\$2,450.99	\$1,548.00	\$4,498.24	\$138,360.09

(1) An additional \$99.00 L/A money spent for wages of laborers and charged to Project BLR-3-1.

(2) An additional \$70.40 L/A money spent for wages of laborers and charged to Project BLR-3-1.

(3) One-fourth of Schreier's salary during period July 1 to August 6 - remainder charged to Connecticut.

Tables 4 and 5 do not include Federal W-A.14 expenditures for the Cambridge regional office totalling \$48,199.36 which consisted of \$43,427.24 for salaries of appointees and \$4,772.12 L/A expenditures.

PART III

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATELY-OWNED LANDS IN NORTHEASTERN REGION - WORK PROJECT BLR-3-1

GENERAL STATEMENT

Nearly 99.9% of all the white pine in the Northeastern Region is on state and privately-owned lands. Blister rust control measures are being applied on these lands under a cooperative agreement in each state between the U. S. Bureau of Entomology and Plant Quarantine and the authorized state regulatory agency - usually the state forestry department. The Bureau is responsible for the leadership, coordination and technical direction of all control activities and under the provisions of the Lea Act, federal funds are allocated for control work in cooperation with the states, counties, towns, associations, and individual pine owners.

The present net control area on state and privately-owned lands comprises 11,337,374 acres including 4,052,217 acres of white pine growth meeting stocking requirements for blister rust control. The initial ribes eradication work has been completed on 93.7% of the control area, 54% has been worked twice, 16.7% three times and 42.2% is now classified as being on maintenance. First work is still needed on 717,543 acres and an additional 5,830,005 acres which have been worked at least once in past years need examination and any necessary rework performed before the areas can be placed on maintenance.

State and Local Cooperation

In Maine, New Hampshire, Massachusetts, Connecticut and New York, state funds are appropriated specifically for blister rust control, while in Vermont, Rhode Island and Pennsylvania, allotments for this purpose are made from state appropriations for general forestry or pest control work. Additional funds were also allotted from other state appropriations during 1949 in Massachusetts, Connecticut and New York. Total state expenditures and contributed services for Project BLR-3-1 during 1949 amount to \$230,967.43, a decrease of 1.8% as compared with the preceding year.

Town cooperation was solicited in Maine, New Hampshire, Vermont, and Connecticut during 1949. A total of 158 towns in these four states provided \$54,436.32 for cooperative ribes eradication work as compared with \$56,406.30 appropriated by 195 towns in 1948. This decrease was primarily due to the fact that the New Hampshire state law making town appropriations compulsory if needed was not applied during the current year, while the total for 1948 included \$10,500. in compulsory appropriations by 29 towns. Actually there was an increase during 1949 of 11.2% in number of towns making voluntary appropriations and 18.6% in appropriations by such towns. One Massachusetts town contributed \$60.00 for control work on its watershed properties in 1949. In Connecticut, there was an unexpended balance of \$11,132.55 at the end of 1949 in the sinking funds for blister rust control in the 22 towns participating in the plan.

County cooperation was restricted to New York where 16 counties spent \$19,846.84 for control work. This includes \$840 for value of contributed services.

Funds from individuals for special control work on their lands dropped to a very small amount in 1949. The total is \$872.82 spent by 20 owners.

The following tables summarize the individual and town cooperation by states.

Table 6 - Local Cooperation on Blister Rust Control Work During 1949
Individual Cooperation

State	No. Cooperators (All on Ribes Eradication)	Amount Spent By Individual Cooperators
Vt.	1	\$67.47
Mass.	10	49.25
Conn.	7	631.30
N.Y.	2	124.80
All States	20	\$872.82

Town Cooperation

State	Appropriations		No. Town Contributions	Amount Town Money Expended
	Number	Amount		
Maine	45	\$9,779.00	-	\$7,992.14
N.H.	94	34,650.00	-	34,118.04
Vt.	35	6,950.00	-	6,904.95
Mass.	-	-	1	60.00
Conn.	14	2,857.32	-	2,270.28
All States	188	\$54,436.32	1	\$51,345.41

Town appropriations in Maine include \$434. held over from 1948 appropriations in three towns.

During 1949, total state and local cooperative expenditures and contributed services for Project BLR-3-1 amounted to \$303,032.50, a decrease of 2.4% from 1948. This is the first year since 1941 that there has not been an increase in total funds available for the project. However, a very small increase would have occurred had the New Hampshire compulsory law been used for the same amount raised under this measure in 1948.

A summary of all state and local expenditures and contributed services' values from 1942 to 1949 is given in the following table:

Table 7 - State and Local Cooperative Expenditures and Contributed Services
For Project BLR-3-1 During Period 1942-1949, Inclusive

Calendar Year	States	Counties	Towns	Individuals	Total
1942	\$47,628.17	\$9,534.75	\$15,601.04	\$2,193.91	\$74,957.87
1943	50,315.35	7,552.88	17,400.82	906.56	76,175.61
1944	56,307.48	11,536.91	17,686.72	833.98	86,365.09
1945	63,509.81	12,162.14	25,039.62	360.85	101,072.42
1946	137,858.85	15,366.66	31,414.71	4,614.71	189,254.93
1947	195,595.14	16,886.81	47,842.22	7,594.15	267,918.32
1948	235,301.19	17,063.52	54,145.80	4,013.14	310,523.65
1949	230,967.43	19,846.84	51,345.41	872.82	303,032.50
Total	\$1,017,483.42	\$109,950.51	\$260,476.34	\$21,390.12	\$1,409,300.39

Control Area Examination and Mapping Work

Due to limited funds, temporary federal personnel on winter examination and mapping work was reduced to six workers early in 1949. Five of these were used in New Hampshire and one in Pennsylvania. During the period from October through December workers for this phase were employed with federal funds in New Hampshire, Vermont, Massachusetts, Connecticut and Pennsylvania. State funds were used for all mappers in New York and for one each in Rhode Island, Connecticut and Pennsylvania. In addition, small amounts of town funds were used for employment of mappers in New Hampshire.

The total examination and mapping time in 1949 from all sources was 4,041 man days. This is 554 man days, or 12.1%, less than the total for 1948. However, the 491,082 acres mapped or remapped in 1949 was 39,340 acres, or 8.7%, more than in 1948. This resulted from an increase in the average output per man day from 98.2 acres to 121.5 acres. These accomplishments include the time necessary for all examination work incident to the mapping which consisted of inspection of 1,511,054 acres.

A direct result of examination and mapping work that is extremely important in planning and conducting the ribes eradication phase is the discontinuation of pine acreage that no longer meets minimum standards and protection zone acreage that is no longer essential. Removing the acreage of these two classes (control area) from the operating maps and records eliminates the possibility of working non-essential area. The net reduction in the total control area for the region in 1949 was 239,685 acres. There was also a net reduction of 32,150 acres in the total pine acreage.

The use of aerial photographs on the scale of 4 inches to the mile as the base on which to outline white pine areas and the adjacent protection zones is standard procedure in many districts. In a few sections no aerial photography has been done so a compass-pacing-traverse mapping procedure is used. In Connecticut, the initial mapping work was completed before the aerial photography method was adopted, and the original maps are still being used except in Litchfield County. Aerial photographs have been purchased for most of this county.

A new method for production of low cost duplicate block maps for field use was developed. This incorporates use of the Standard Duplicator or "Ditto" machine to reproduce copies of the maps from carbon "masters". The masters are made in the field offices as tracings of the original maps. All reproduction is done in the Regional Office. An advantage of this process is that the copies can be made on either plain or grid (cross section) paper whichever is needed. Only a few copies of each map are required in the year the block is worked, with no further use of them for several years until the unit is worked again, so this method serves well to provide a few inexpensive work maps when needed.

From a small amount of exploratory work including a short test ride, mapping from a helicopter appears to offer possibilities for fast, low cost mapping. As presently conceived, the helicopter would take the place of most ground work now performed to check the timber types that have previously been

outlined and tentatively identified on the photograph. Using these same pre-marked photographs, it should be possible for a mapper to complete identification of the types and adjust type boundaries where necessary while the helicopter is cruising slowing or even hovering at a very low level over the areas. It may be impossible to determine accurately that pine reproduction is growing under hardwood or that very small pine reproduction has started on brushy cutover land but most types should be clearly identifiable from an altitude as low, possibly, as 10 feet from the growth top level. Only a small amount of supplemental groundwork would then be necessary to complete the job. With indication that a very high rate of coverage can be accomplished from the air, this method may give both the speed and thoroughness necessary for rapid, accurate mapping at low cost. A test of this method is planned for the spring of 1950.

The examination and mapping work done in 1949 is summarized in the following table:

Table 8 - Results of 1949 Control Area Examination and Mapping Work

State	Acreage Detail Mapped			Additional Acreage Examined But Not Mapped			Total Man Days
	Initial Mapping	Re- mapping	Total	Inside Control Area	Outside Control Area	Total	
Maine	1,775	5,126	6,901	415	8,553	8,968	38
N.H.	96,116	17,479	113,595	100,042	75,984	176,026	574
Vt.	4,680	3,713	8,393	30,810	47,403	78,213	137
Mass.	9,858	62,063	71,921	15,640	146,128	161,768	222
R.I.	0	8,146	8,146	24	9,276	9,300	73
Conn.	0	31,506	31,506	8,735	110,622	119,357	215
N.Y.	49,751	99,238	148,989	342,524	464,228	806,752	2,365
Penna.	7,218	94,413	101,631	143,075	7,595	150,670	417
All States	169,398	321,684	491,082	641,265	869,789	1,511,054	4,041

RIBES ERADICATION WORK ON STATE AND PRIVATE LANDS

Weather Conditions

Officially described as the driest summer on record in most of the region, the 1949 eradication season ended with what is probably the smallest percentage of time lost because of rain of any season in the history of the project. With a very small amount of snow to melt in the spring, an early season developed. This started the eradication work at an early date in May which, normally a rainy month, was very dry. The most severe phase of the weather was the high temperature coupled with the drought from June through August which caused some slowdown in crews. This extremely hot and dry weather continued for so long that emergency restrictions were placed on woods activities in most of the states. These did not handicap control activities in any way but governed the woods conduct of all workers. Heavy rains in September terminated the drought and the acute danger of forest fires.

Labor Conditions

For the first time since pre-war years a full supply of labor was available in all areas. It was also found that the quality of labor was generally better. As a result, it was possible in all districts to start in the spring and continue throughout the season with the number of men that the limited funds would employ. Because of the better quality of workers, it was possible to train and use more scouts, crew leaders and dragline crew workers. These factors combined were primary in accomplishing the 25.5% increase in acres worked per man day.

Wage Rates for Temporary Federal Personnel

On the basis of a region-wide survey of hourly wages paid for comparable work, the 1948 scale of 88 cents for crewmen, 98 cents for crew leaders, and \$1.10 for scouts and foremen was recommended and approved for 1949. Due to a mid-season change in state rates paid in Massachusetts for blister rust control and other work, the top rate of \$1.10 was increased to \$1.26 per hour for that state only. In all other states the starting rates were continued throughout the season.

Temporary Personnel Employed on Control Work

During 1949 the maximum number of workers was 572, which is an 18% drop from the peak in 1948 and 37% from 1947. The decrease in federal workers was only from 273 to 265, but the period of their employment was shorter in 1949 than in 1948. The net result of these differences was a 16.8% decrease in total man days in 1949. A large part of this is attributable to the smaller amount of federal funds available in 1949.

Table 9 - Temporary Personnel Employed on Control Work

State	Maximum Number of Workers Employed by All Agencies	Federal Workers (W-E.14 Funds)		
		Maximum Number	Total Number	Period of Peak Employment
Maine	69	36	50	July 24-Aug. 6
N.H.	107	40	63	Aug. 7-Aug. 20
Vt.	35	27	29	July 24-Aug. 20
Mass.	22	9	13	June 26-Sept. 17
R.I.	3	1	1	May 29-June 25
Conn.	19	11	11	June 26-July 9
N.Y.	263	130	167	Aug. 7-Aug. 20
Penna.	54	11	15	Aug. 7-Aug. 20
All States	572	265	349	-

Results of Ribes Eradication Work on State and Private Lands

Since none of the 1949 ribes eradication work was done on federally-owned lands, the total accomplishment is creditable to the state and private lands classification. This includes removal of 3,918,825 ribes from 1,010,688 acres by 34,831 man-days of labor. Of these totals, New York accounted for 36% of the acreage, 54% of the ribes, and 51% of the man days. Maine and New Hampshire each accounted for about 17% of the acreage but New Hampshire had 18% to Maine's 9% of the ribes, and 16% to 9% of the man days. Pennsylvania, Vermont, Massachusetts and Connecticut, in that order, each accounted for 6 to 8% of the acreage and Rhode Island about 2%. Ribes and man days for each were Pennsylvania 8%, 10%; Vermont 6%, 7%; Massachusetts 2%, 5%; Connecticut 3%, 3%; and Rhode Island less than 1% for each.

Completion of the initial work is stressed to the extent that funds are available for use where the work is needed and that this work can be done economically in conjunction with other work of as high or higher priority. Of the total acreage worked in 1949, nearly 17% was first working. Vermont again led with about 58% in this class which brings this State's initial work to 78.4% completed. The other states in which initial work remains had from 10 to 17% of their total season's acreage in this class.

With a new high of over one million acres worked, 1949 accomplishments exceed those of 1948 by 4.5%. However, this was done with 16.8% fewer man days through more extensive use of improved working methods and better labor. Included was greater use of a modified dragline method which was worked out through tests and demonstrations during the summer. The gain over 1948 averaged 5.9 acres per man day or 25.5%. However, three of the states had a decrease in rate of production from 3.4% to 12.4% so the average improvement in the five states that showed increases was considerably higher than the average gain for the region. The individual scores for these states ranged from 25.5% to 112.7%.

The results of all ribes eradication work on state and private lands is summarized in the following tables:

Table 10 - Ribes Eradication Work on State and Private Lands During 1949
First Work

State	Total Acreage Worked	% Total For Each State	Average Acreage Worked Per District In Each State	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
				Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	25,009	14.6	8,336	79,010	60	773	3.2	.031	32.4
N. H.	27,078	15.9	4,513	168,682	429	1,089	6.2	.040	24.9
Vt.	38,072	22.3	12,600	132,785	115	1,343	3.5	.035	28.3
Mass.	6,615	3.9	3,308	10,738	68	176	1.6	.027	37.6
N. Y.	63,728	37.4	7,041	984,596	1,230	5,878	15.4	.092	10.8
Penna.	10,015	5.9	3,338	71,060	29	573	7.1	.057	17.5
All States	170,517	100.0	5,880	1,446,871	1,931	9,832	8.5	.058	17.3

Second Work

Maine	92,579	21.7	30,860	235,505	371	1,922	2.5	.021	48.2
N. H.	118,371	27.7	19,729	366,786	394	3,601	3.1	.030	32.9
Vt.	23,799	5.6	7,933	78,295	5	821	3.3	.034	29.0
Mass.	49,800	11.7	24,904	49,180	697	1,214	1.0	.024	41.0
N. Y.	103,102	24.1	11,456	731,907	1,330	5,686	7.1	.055	18.1
Penna.	39,133	9.2	13,044	190,205	3,024	1,761	4.9	.045	22.2
All States	426,793	100.0	14,717	1,651,878	5,821	15,005	3.9	.035	28.4

Other Workings

Maine	57,639	14.0	19,213	40,075	44	524	0.7	.009	110.0
N. H.	28,701	6.9	4,783	184,183	406	770	6.4	.027	37.3
Vt.	3,899	0.9	1,300	15,484	0	170	4.0	.044	22.9
Mass.	8,628	2.1	4,314	9,039	19	230	1.0	.027	37.5
R. I.	21,491	5.2	21,491	2,047	0	165	0.1	.008	130.2
Conn.	64,520	15.6	32,260	109,387	0	910	1.7	.014	70.9
N. Y.	200,690	48.6	22,299	401,053	249	6,171	2.0	.031	32.5
Penna.	27,810	6.7	9,270	58,808	649	1,054	2.1	.038	26.4
All States	413,378	100.0	14,254	820,076	1,367	9,994	2.0	.024	41.4

All Work

Maine	175,227	17.4	58,409	354,590	475	3,219	2.0	.018	54.4
N. H.	174,150	17.2	29,025	719,651	1,229	5,460	4.1	.031	31.9
Vt.	65,770	6.5	21,923	226,564	120	2,334	3.4	.035	28.2
Mass.	65,052	6.4	32,526	68,957	784	1,620	1.1	.025	40.2
R. I.	21,491	2.1	21,491	2,047	0	165	0.1	.008	130.2
Conn.	64,520	6.4	32,260	109,387	0	910	1.7	.014	70.9
N. Y.	367,520	36.4	40,836	2,117,556	2,809	17,735	5.8	.048	20.7
Penna.	76,958	7.6	25,652	320,073	3,702	3,388	4.2	.044	22.7
All States	1,010,688	100.0	34,851	3,918,825	9,119	34,831	3.9	.034	29.0

Ribes populations encountered in 1949 varied only slightly, on the average, from 1948. The greatest difference was in first working where there was an increase from 6.7 to 8.5 bushes per acre. This was due mainly to increases of from 2.5 to 3.3 bushes per acre in Maine, New York and Pennsylvania. Second working and other workings averages varied only slightly, with 1948 and 1949 figures of 3.8 and 3.9 bushes per acre for the former and 1.7 and 2.0 bushes for the latter. New Hampshire showed the greatest change going from 2.6 to 6.4 bushes per acre for other workings. The 6.4 bush average is greater than their 6.2 bushes per acre for first work which reflects some of the ribes regeneration that develops after disturbance of area that has been worked at least two times.

During 1949 the average area worked per district was 36,096 acres. This is an increase of 1,545 acres per unit over 1948 and 2,982 acres over 1947. The individual district totals ranged from 9,125 acres to 97,423 acres with 22 of the 28 districts reporting over 20,000 acres. Nearly 60% of the districts had acreage increases while the decreases in another 20% were very small.

Ribes Eradication Work on Maintenance Areas

Starting with the first use of the maintenance classification in 1941, additional acreage has been added each year until 4,789,823 acres of state and privately-owned lands are now in this category. In the period from 1941 to 1945 small amounts of this were reworked and reported as second working or other working, whichever fit the case. Following the decision reached at the Regional Leaders' Conference in Washington in 1946, all maintenance area worked is now reported in the omnibus tables with other workings, but in this region it is also compiled separately as maintenance working. Consequently, the total of maintenance working in the Northeastern Region is the acreage worked from 1946-1949, inclusive, which is summarized in Table 34 of the Appendix.

During 1949 maintenance of control work was done in all states except Massachusetts. The results are given in the following table:

Table 11 - Maintenance Work on State and Private Lands During 1949
(Data included in Table 10)

State	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
		Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	6,151	5,271	1	81	0.9	.013	75.9
N.H.	3,500	1,094	126	44	0.3	.013	79.5
Vt.	1,738	2,091	-	43	1.2	.025	40.4
R.I.	21,491	2,047	-	165	0.1	.008	130.2
Conn.	64,520	109,387	-	910	1.7	.014	70.9
N.Y.	106,003	153,111	219	2,669	1.4	.025	39.8
Penna.	8,753	1,750	40	115	0.2	.013	76.1
Totals	212,156	274,751	386	4,027	1.3	.019	52.7

In Connecticut and Rhode Island all work done in 1949 was on maintenance areas. In the other states the amounts of total eradication work that was done on maintenance area were 2% in New Hampshire, 3% in Maine and Vermont, 11% in Pennsylvania, 29% in New York. The regional total is 21%. The average number of ribes per acre was consistently low in all states with 1.7 for Connecticut the highest, and a regional average of 1.3.

Comparison of 1948 and 1949 Ribes Eradication Results

In 7 of the 8 states the number of man days in 1949 was below that in 1948. However, 6 of the 8 increased the acreage worked from about 6% to 46%. Massachusetts stands out with about 31% increase in acreage with 38% fewer man days. New Hampshire, with the heaviest cut of nearly 36% in man days, had a 9.8% increase in acres worked. Others that showed increased acreage with 4 to 13% fewer man days are Rhode Island 45.9%, New York 17.6%, and Connecticut 9.3%. Maine, the only state with increased man days (14.3%) had nearly a 6% increase in acres. Pennsylvania dropped 35.7% in man days and 43.6% in acres which is due chiefly to the stoppage of most state-paid work in the early part of the season until project authorizations under a new system of project control could be established. This caused a large reduction in worker time available and reduced the efficiency of operations by shortening the length of time workers could be used after their training and breaking-in period.

Comparisons of the 1948 and 1949 results are made in the following table:

Table 12 - Comparison of Results of 1948 and 1949 Ribes Eradication Work on State and Private Lands

State	Total Acreage Worked			No. Ribes Destroyed			Man Days Employment		
	1948	1949	% Increase or Decrease in 1949	1948	1949	% Increase or Decrease in 1949	1948	1949	% Increase or Decrease in 1949
Maine	165,600	175,227	+ 5.8	300,963	354,590	+17.8	2,817	3,219	+14.3
N.H.	158,624	174,150	+ 9.8	764,378	719,651	- 5.9	8,496	5,460	-35.7
Vt.	70,791	65,770	- 7.1	229,820	226,564	- 1.4	2,427	2,334	- 3.8
Mass.	49,712	65,052	+30.9	102,168	68,957	-32.5	2,625	1,620	-38.3
R.I.	14,732	21,491	+45.9	1,314	2,047	+55.8	188	165	-12.2
Conn.	59,047	64,520	+ 9.3	70,442	109,387	+55.3	1,047	910	-13.1
N.Y.	312,511	367,520	+17.6	1,735,313	2,117,556	+22.0	18,929	17,735	- 6.3
Penna.	136,401	76,958	-43.6	351,601	320,073	- 9.0	5,269	3,388	-35.7
All States	967,418	1,010,688	+ 4.5	3,555,999	3,918,825	+10.2	41,798	34,831	-16.7

In the following table comparing 1948 and 1949 production rates, it will be noted that six states reported first work, six second work and eight other work. Considering each of these as a separate case, there were 20 possibilities for change in production per man day. It is significant that in 14, or 70%, of the cases increases are shown. These range from 1% to 223% while the six decreases are from 4% to 36%. Although there are several factors that influence this rate, probably the greatest single item responsible for the increases was the use of more small crews of one to three men each. Coupled with this was greater use of the dragline as a tool for expediting the work of small crews.

The decreases in production in Maine and Pennsylvania are attributable chiefly to heavier ribes populations. In Vermont, there was very little change in ribes populations but there was also only a small drop in acreage per man day for first work. The larger decline for other work is due to some other factor not clearly evident.

Table 13 - Comparison of Production Rates For 1948 and 1949
(Acres Worked Per Man Day)

State	First Work			Second Work			Other Work			All Work		
	1948	1949	% Increase or Decrease in 1949	1948	1949	% Increase or Decrease in 1949	1948	1949	% Increase or Decrease in 1949	1948	1949	% Increase or Decrease in 1949
Maine	43.8	32.4	-26.0	45.5	48.2	+ 5.9	63.8	110.0	+72.4	50.7	54.4	+ 7.3
N.H.	14.1	24.9	+76.6	18.8	32.9	+75.0	28.2	37.3	+32.3	18.7	31.9	+70.6
Vt.	29.6	28.3	- 4.4	28.7	29.0	+ 1.0	27.9	22.9	-17.9	29.2	28.2	- 3.4
Mass.	21.3	37.6	+76.5	18.8	41.0	+118.1	11.6	37.5	+223.3	18.9	40.2	+112.7
R.I.	-	-	-	-	-	-	78.4	130.2	+66.1	78.4	130.2	+66.1
Conn.	-	-	-	-	-	-	56.4	70.9	+25.7	56.4	70.9	+25.7
N.Y.	9.8	10.8	+10.2	15.8	18.1	+14.6	25.7	32.5	+26.5	16.5	20.7	+25.5
Penna.	18.8	17.5	- 6.9	23.2	22.2	- 4.3	41.5	26.4	-36.4	25.9	22.7	-12.4
All States	14.8	17.3	+16.9	21.4	28.4	+32.7	34.5	41.4	+20.0	22.6	29.0	+28.3

Checking of 1949 Ribes Eradication Work

Three procedures are used in checking the ribes eradication work in this region: (1) foreman's observations as he works behind the crew and virtually reexamines the ground covered by the men in formation, (2) rework of a portion of a strip by the entire crew, and (3) measured general checks of worked areas by the district leader or checker. In addition, supervisory personnel make observations of crews at work to make certain that proper procedures are being used.

During the past two seasons, all measured general check reports have been sent direct from the field to the state leaders' offices for summarization and analysis. This new procedure makes it possible for the state leader to follow checking results closely and take any corrective action deemed necessary within a few days after the check is made.

The district leaders and their assistants spent 4039 hours making 2,260 measured general checks in worked areas during 1949. A total of 10,647 ribes with 29,826 feet of live stem were found on the 3,467 acres covered by the checks, or an average of 3.1 bushes with 8.6 feet of live stem per acre. The following table summarizes the results of this work by states and gives an analysis of the data on the basis of averages per district.

Table 14 - Results of Measured General Checks of 1949 Ribes Eradication Work

State	No. Checks	Hours Checking	Acres in Strip Checks	Ribes Found on Checks		Ribes Live Stem Found on Checks		Control Work	
				Total Number	Ave. Per Acre	Total F.L.S.	F.L.S. Per Acre	Approved	Disapproved
Maine	76	78½	51.17	245	4.8	480½	9.4	72	4
N.H.	181	222	138.75	430	3.1	825	5.9	176	5
Vt.	178	206½	220.0	644	2.9	1,659	7.5	175	3
Mass.	191	259½	232.25	513	2.2	1,441½	6.2	190	1
R.I.	30	38	28.8	38	1.3	369	12.8	27	3
Conn.	103	198½	204.85	905	4.4	3,563	17.4	87	16
N.Y.	1,375	2,895	2,486.75	7,379	3.0	20,134½	8.1	1,283	92
Penna.	126	141	104.6	493	4.7	1,356	13.0	103	23
All States	2,260	4,038½	3,467.17	10,647	3.1	29,828½	8.6	2,113	147

Analysis

State	No. Districts	Averages Per District				% Total Acreage Worked During 1949 Covered by Measured General Checks	% Areas Checked Which Were Approved
		Acreage Cleared of Ribes	No. Measured General Checks	Hours on Measured General Checks	Acreage of Measured General Checks		
Maine	3	58,409	25.3	26.2	17.1	0.03	94.7
N.H.	6	29,025	30.2	37.0	23.1	0.08	97.2
Vt.	3	21,923	59.3	68.7	73.3	0.33	98.3
Mass.	2	32,526	95.5	129.7	116.1	0.36	99.5
R.I.	1	21,491	30.0	38.0	28.8	0.13	90.0
Conn.	2	32,260	51.5	99.2	102.4	0.16	84.5
N.Y.	9	40,836	152.8	321.7	276.3	0.68	93.3
Penna.	3	25,653	42.0	47.0	34.9	0.05	81.7
All States	29	34,851	77.9	139.3	119.6	0.34	93.5

Compared with 1948, there were increases during 1949 in the regional totals for all phases of the measured general checking work - 10.2% in number of checks, 12.3% in time spent checking, and 8.8% in acreage checked. An analysis of the results by states shows increases, except in New Hampshire where there was a general decrease of approximately 20% in the various phases of the checking activities. There were also decreases of 18% in time spent on checking in Connecticut and 4.6% in acreage checked in Pennsylvania. On a percentage basis the largest increases were in Maine, Massachusetts and Rhode Island. However, only a relatively few checks were made in Maine where greater emphasis has been placed during recent years on supervisory inspections of the crews at work. Nearly 61% of all the checks made in the region were in New York. Few measured general checks are necessary in sections such as southern New England where the ribes populations are generally low and much of the work is performed by scouting. A large percentage of the current year's eradication work in Maine and Pennsylvania was also performed by scouts.

An average of 3.1 bushes and 8.6 feet of live stem per acre were found on the checks as compared with 2.8 and 8.5, respectively, in 1948.

The average number of ribes ranged from 1.3 per acre in Rhode Island to 4.8 in Maine, while the live stem averages varied from 6.2 feet per acre in Massachusetts to 17.4 in Connecticut. In the latter state, the average was greatly influenced by the results of a relatively few checks in the western district where occasional areas with heavy ribes populations are encountered. By excluding the data for four of these checks where the work was disapproved, the average live stem per acre for the other 99 checks in Connecticut was only 12.9 feet. Six of the 103 checks had 44% of the total live stem.

The control work was disapproved on 6.5% of all the areas where measured general checks were made this year as compared with 5.6% in 1948. Although only three areas were disapproved in Rhode Island, they represented 10% of the total number checked. The checks in disapproved areas in Connecticut and Pennsylvania comprised 15.5% and 18.3%, respectively, of all checks in these two states. In the other states the results ranged from 0.5% in Massachusetts to 6.7% in New York. The high percentages in Rhode Island and Connecticut are due to the restriction of checking to the few areas where ribes concentrations are encountered. In Pennsylvania, 52% of the disapproved checks were in one district where many areas with numerous *Ribes rotundifolium* occur. Corrective action was taken in all cases where the checks showed unsatisfactory work.

The 1949 checking summaries from the states did not show district totals in all instances. Consequently, it was not possible to compile information on the average live stem per acre found on checks in disapproved areas for all states.

Automotive Equipment

At the end of 1949, federally-owned automotive equipment in this region included 61 trucks and 30 passenger-carrying vehicles as follows:

<u>Year of Manufacture</u>	<u>Trucks (All Half-Ton)</u>			<u>Passenger Cars</u>	
	<u>Pick-Ups</u>	<u>Sedan Deliveries</u>	<u>Suburban Carry-All</u>	<u>Coaches</u>	<u>Sedans</u>
1935.....	13	-	-	-	-
1936.....	5	1	-	-	-
1939.....	5	2	1	-	-
1940.....	-	-	-	1	-
1941.....	-	-	-	3	-
1942.....	-	-	-	5	-
1947.....	32	-	-	-	3
1948.....	-	-	-	4	-
1949.....	2	-	-	-	14
Total.....	57	3	1	13	17

Authorization was granted for the purchase of four new passenger cars during the fiscal year 1950. Two of these machines were delivered during February, 1950. Turn-ins for these four new cars include three 1941 models and one 1942 coach which are included above. These replacements will leave us with only five old passenger cars - one 1940 and four 1942 models.

As indicated above, 27 of the 61 trucks are of 1935-1939 origin. Many of the old trucks are in poor condition and should be replaced as soon as funds are available. These old trucks have mileages ranging from 41,375 to 147,766 miles, the average being 72,503. However, the relatively low mileages for some of the trucks is no indication of their true condition, since they have been used chiefly on rough rural roads and some of them had hard usage before being transferred to our Division, especially the 1939 Plymouths obtained from the Division of Grasshopper Control.

White Pine Blister Rust Survey in New Jersey

The State Department of Agriculture in New Jersey conducted a survey during June and July to determine blister rust infection and ribes conditions in the portions of eight townships in Sussex, Passaic and Morris Counties which comprise the entire control area of 16,742 acres in that state. No ribes eradication work has been performed in New Jersey since 1937 and all of the control area has been classified as being on maintenance.

The two temporary state employees assigned to this survey project were trained for a short period by K.K. Stimson. Pine areas were scouted intensively for blister rust infection and likely ribes sites examined for ribes. Records were kept on the number and location of infected pines, age of cankers, number of ribes bushes located, and amount of infection on such bushes. The following is an excerpt from the state report summarizing the results of this survey:

"In general, it can be reported that currants and gooseberries were only occasionally found. The find usually consisted of only one or two bushes. Rarely a dozen or more bushes were found, but even in such cases they would be in one clump. In almost all cases no infection was present on ribes, but occasionally a very light infection was observed.

"At one location in the Pequannock watershed heavy infection of ribes was found. There was an abundance of ribes growing throughout the white pine plantation. Three trees had been killed by the disease, and active cankers were located on many others. Eradication of ribes, should be practiced in this stand. This was the only place where good establishment of the disease on both hosts was located. In other areas cankers dating back to 1940-1941 and earlier were observed, but infected ribes could not be found, and the infection had apparently not spread.

"In the Wanaque watershed no infected white pine was found. In the Stokes State forest, only seven trees were found to have cankers, and these were 1940 infections with inactive cankers.

"It appears from this survey that white pine blister rust is of no great importance in New Jersey, and that adequate protective measures can and should be taken by the planter of white pine trees to assure him of a disease free stand. This disease constitutes no problem in New Jersey in native pine stands."

Injuries to Temporary Federal L/A Employees

A total of 349 temporary workers were employed for 12,662 man days on federal L/A funds in this region during 1949. These men actually worked 11,770 days and were granted annual, sick or terminal leave for the remaining 892 days. Only nine, or 2.6%, of the total sustained injuries which necessitated medical services while on official duty. No time was lost by four of the injured, while the other five were disabled for a total of only 27 working days. The 27 work days lost represented 0.21% of the total time and 0.23% of the actual working time of all federal L/A employees during the year.

Table 15 - Number and Types of Injuries To Temporary Federal L/A Employees During Calendar Year 1949

State	Total No. Injuries	Causes of Injuries			
		Ivy or Oak Poisoning	Slipping or Falling	Insect Bites	Misc.
Maine	1	-	1	-	-
N.H.	1	-	1	-	-
N.Y.	7	4	1	1	1*
Total	9	4	3	1	1

*Stubbed toe on rock - infection developed.

In addition to the injuries listed above, District Leader DeBerti, of Pennsylvania, sustained a non-disabling injury. While getting out some Government equipment stored in an old C.C.C. camp, he stepped on a nail which punctured his foot.

State Compensation For Cultivated Ribes Destroyed During 1949

It was not necessary for the states to compensate any of the owners of the 9,119 cultivated ribes destroyed in connection with the 1949 control activities. Table 31 in the Appendix lists information on cultivated ribes compensation for all years.

Nursery Sanitation Work During 1949

Sanitation work was performed in the environs of nine nurseries in Connecticut, New York, and Pennsylvania during 1949. A total of 75 man days were spent examining 5,067 acres and 10,885 wild ribes were located and destroyed. Over 96% of these bushes were pulled around the one nursery worked in Pennsylvania. There were 60,935,000 white pines in the nine nurseries worked.

The following table summarizes the results of the 1949 nursery sanitation work by states, while Tables 25 and 26 in the Appendix show the accumulative accomplishments and the present status of such activities.

Table 16 - Nursery Sanitation Work During 1949
(All Rework)

State	No. Nurseries Worked	Est. No. White Pines in Nurseries Worked	Acreage Worked	No. Ribes Destroyed (All Wild)	Total Man Days	No. Ribes Per Acre	Acres Worked Per Man Day
Conn.	3	385,000	1,036	4	3	.003	345.3
N.Y.	5	60,450,000	3,661	381	38	.1	96.3
Penna.	1	100,000	370	10,500	34	28.4	10.9
Totals	9	60,935,000	5,067	10,885	75	2.1	67.6

Blister Rust Canker Elimination Work During 1949

Blister rust canker elimination work during the current year was restricted to two New York districts, where the leaders gave technical supervision to projects conducted at the Eighth Lake, Caroga Lake, Lake Durant, Moffitta Beach, Golden Beach and Sacandaga state campsites. A total of 4,786 white pines were examined and 609 fatally diseased trees were cut down. In addition, 794 branch infections and 71 stem cankers were removed from 324 other pines. This work required 177 man days labor and was all performed by state employees.

Status of Control Work on State and Private Lands

At the end of 1949 the control area on state and private lands totalled 11,337,374 acres, of which 4,052,217 acres support stands of white pine that meet the minimum stocking requirements for blister rust control. Over three-fourths of the control area has been detail mapped but the extensive timber type changes caused in the past 12 years by two hurricanes, several large fires and greatly expanded logging have made the original maps obsolete for a large part of this acreage. The first working has been extended to 93.7% of the control area, second working to 54% and third working or more to 16.7%. The area now on maintenance is 42.2% of the regional total and includes all of the control area in Connecticut, Rhode Island and New Jersey. The 1949 increase in area on maintenance was 665,965 acres which is the largest amount so classified in any year since 1943.

Further reductions in the control area and white pine area acreages were made in 1949 as the mapping and remapping progressed. The control area dropped 239,685 acres and the pine area 32,142 acres. These follow the general pattern of decreases of the past 10 years during which time the control area has been cut about 2,290,000 acres, or 17%, and the white pine type 643,000 acres, or about 14%.

The following table gives the current status of control work in each state:

Table 17 - Status of Blister Rust Control Work on State and Private Lands
(November 30, 1949)

State	Total Acreage of Net Control Area	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage on Main- tenance	Percentage of Net Control Area			
				Pre-Maintenance Work			All Main- tenance Work		Detail Mapped	Worked Once	Worked Twice	On Main- tenance
				First Work	Second Work	Other Workings						
Maine	2,440,501	959,347	2,147,648	2,259,910	1,287,725	163,222	12,746	874,705	88.0	92.6	52.8	35.8
N.H.	2,836,874	1,283,265	1,582,962	2,720,588	1,147,088	124,766	5,846	718,610	55.8	95.9	40.4	25.3
Vt.	716,775	161,420	708,823	561,560	252,247	26,017	1,766	295,308	98.9	78.3	35.2	41.2
Mass.	1,535,338	574,835	1,030,902	1,506,553	1,095,770	134,752	0	1,084,018	67.1	98.1	71.4	70.6
R.I.	141,808	62,020	127,404	141,808	135,925	34,068	66,573	141,808	89.8	100.0	95.9	100.0
Conn.	449,215	89,317	449,215	449,215	307,196	129,643	202,065	449,215	100.0	100.0	68.4	100.0
N.Y.	2,591,145	792,734	2,044,483	2,421,496	1,642,035	684,617	203,238	902,772	78.9	93.5	63.4	34.9
N.J.	16,742	3,771	0	16,742	1,417	0	0	16,742	0	100.0	8.5	100.0
Penna.	608,976	125,508	579,959	541,959	256,650	60,321	38,565	306,645	95.2	89.0	42.1	50.4
All States	11,337,374	4,052,217	8,671,396	10,619,831	6,126,053	1,357,406	530,799	4,789,823	76.5	93.7	54.0	42.2

Although there were net reductions in control area and white pine area for the entire region during 1949, four states showed increases in one or both classes. The following is a summary of the changes by states:

	<u>Control Area</u>		<u>White Pine Area</u>	
	<u>Decreases</u> (Acres)	<u>Increases</u> (Acres)	<u>Decreases</u> (Acres)	<u>Increases</u> (Acres)
Me.	19,312	-	7,282	-
N.H.	75,732	-	16,239	-
Vt.	-	1,140	-	3,376
Mass.	59,535	-	8,542	-
R.I.	-	5,683	-	1,864
Conn.	3,962	-	-	2,836
N.Y.	15,583	-	-	678
Pa.	72,584	-	8,883	-

These figures show that the major changes in 1949 were reductions in both control area and pine area in New Hampshire, Pennsylvania, Massachusetts and Maine. New York and Connecticut control areas were reduced but both added new pine area while Vermont and Rhode Island gained in both classes.

The status table brings out the point that New Hampshire and Massachusetts are considerably behind the other states in the mapping phase; that Vermont and Pennsylvania have the largest amounts of unworked area; and that New Hampshire, New York and Maine, in that order, have the lower percentages of area on maintenance. Comparing with the status in 1945, mapping gains were best in New Hampshire (2.8%), Massachusetts (2.4%) and New York (2.1%); coverage of unworked area was highest in Vermont with a gain of 3.6%; and increases in area on maintenance were greatest in Vermont (16.5%) and Pennsylvania (13.1%) although Maine, New Hampshire, Massachusetts and New York had substantial gains in this class.

In recent years programs have been outlined for each state in which completion of the necessary pre-maintenance work in six states and the maintenance of control in the other three have been projected. The post-war program, drafted in 1945, got off to a fair start with increased federal and cooperative funds, but a drastic cut in federal appropriations in 1948 and inadequate cooperative money in some states prevented full scale operations. Revised programs were outlined in 1948 but the success of these was also predicated on increased funds along with increased rates of work production through improved control methods. The major increases in funds, which are needed from the federal government and three of the states, have not materialized. However, the rate of work output has been increased very substantially in all states and will be increased even more. The following table sets forth the major control work needs of initial mapping and ribes eradication in each state.

Table 18 - Control Work Needed on State and Private Lands
(As of November 30, 1949)

State	Total Acreage of Net Control Area	Acreage in Net Control Area in Need of			Percentage of Net Control Area in Need of		
		Initial Detail Mapping	Pre-Maintenance Work		Initial Detail Mapping	Pre-Maintenance Work	
			First Work	Rework		First Work	Rework
Maine	2,440,501	292,853	180,591	1,385,205	12.0	7.4	56.8
N.H.	2,836,874	1,253,912	116,286	2,001,978	44.2	4.1	70.6
Vt.	716,775	7,952	155,215	266,252	1.1	21.7	37.1
Mass.	1,535,338	504,436	28,785	422,535	32.9	1.9	27.5
R.I.	141,808	14,404	0	0	10.2	0	0
Conn.	449,215	0	0	0	0	0	0
N.Y.	2,591,145	546,662	169,649	1,518,724	21.1	6.5	58.6
N.J.	16,742	16,742	0	0	100.0	0	0
Penna.	608,976	29,017	67,017	235,314	4.8	11.0	38.6
All States	11,337,374	2,665,978	717,543	5,830,008	23.5	6.3	51.5

The initial mapping ahead is one of the larger requirements of the program with about 2 2/3 million acres involved. In addition there is remapping of about 4 million acres to be done. New Hampshire, Massachusetts and New York have the largest amounts of mapping and remapping to be accomplished with nearly one-half the total in New Hampshire alone. Completion of the initial ribes eradication work is no longer a major problem although there are still 717,543 acres to be done. Most of this will be worked in the next few years in conjunction with necessary rework adjacent to or near the unworked acreage. Over 87% of the unworked land is in Maine, New York, Vermont and New Hampshire. By far the weightiest and most pressing problem is the rework which is needed on 5,830,000 acres or over half of the control area. When this is combined with about 6,666,000 acres of mapping and remapping, it is clearly evident that these two phases alone constitute a very large work program.

Expenditures For Project BLR-3-1

State and local cooperative expenditures (direct aid) for Project BLR-3-1 during the calendar year 1949 totalled \$303,032.50, which was a decrease of 2.4% as compared with the previous year. The following tabulation gives a comparison of such cooperative expenditures in each state during the past two years:

State and Local Cooperative Expenditures For Project BLR-3-1

<u>State</u>	<u>1948</u>	<u>1949</u>	<u>% Increase or Decrease in 1949</u>
Maine.....	\$15,477.19	\$15,537.70	+ 0.4
N.H.	55,155.39	46,107.67	-16.4
Vt.	7,345.10	8,703.47	+18.5
Mass.	13,336.14	10,987.94	-17.6
R.I.	1,716.52	1,763.10	+ 2.7
Conn.	12,237.18	13,109.33	+ 7.1
N.Y.	170,599.39	179,250.65	+ 5.1
Penna.	34,656.74	27,572.64	-20.4
Total.....	\$310,523.65	\$303,032.50	- 2.4

Although the regional total for 1949 was slightly less than the preceding year, five of the eight states showed increases in cooperative expenditures for this project, ranging from 0.4% in Maine to 18.5% in Vermont. The 16.4% decrease in New Hampshire was due to the fact that the state law, compelling towns to appropriate for blister rust control, was not applied during the current year, whereas in 1948 there were 29 compulsory appropriations amounting to \$10,500. In Massachusetts, the decrease of \$2348.20 in 1949 was less than the amount spent during 1948 by the Metropolitan District Commission for control work on the Quabbin and Ware River watersheds. Plans were made to continue this project in 1949, but the work was postponed due to lack of funds. The decrease in Pennsylvania was caused by a stoppage of most state paid work in the early part of the 1949 season until project authorizations under a new system of project controls could be established.

For the second straight year there was a decrease in federal expenditures for Project BLR-3-1. Such expenditures in 1949 amounted to \$146,381.36 as compared with \$157,744.53 in 1948 and \$300,316.70 during 1947 - a decrease of 51.3% in two years. On the other hand, direct aid by the states and their cooperators jumped from \$157,744.53 in 1947 to \$310,523.65 in 1948 and \$303,032.50 during the current year. As indicated in the following tabulation, federal expenditures in 1949 exceeded direct aid furnished by the states and local cooperators in Maine, Vermont and Massachusetts, but there were large deficiencies in federal matching funds in three of the other states:

<u>Expenditures For Project BLR-3-1</u>				<u>% Total By</u>	
<u>During Calendar Year 1949</u>					
<u>State</u>	<u>Federal</u>	<u>Local Cooperators</u>	<u>Total</u>	<u>Federal</u>	<u>Local Cooperators</u>
Maine...	\$17,365.29	\$15,537.70	\$32,902.99	52.8	47.2
N.H. ...	22,075.91	46,107.67	68,183.58	32.4	67.6
Vt.	16,575.32	8,703.47	25,278.79	65.6	34.4
Mass. ..	11,754.00	10,987.94	22,741.94	51.7	48.3
R.I. ...	1,410.75	1,763.10	3,173.85	44.4	55.6
Conn. ..	10,031.63	13,109.33	23,140.96	43.4	56.6
N.Y. ...	55,191.80	179,250.65	234,442.45	23.5	76.5
Penna...	11,976.66	27,572.64	39,549.30	30.3	69.7
Total..	\$146,381.36	\$303,032.50	\$449,413.86	32.6	67.4

The greatest difference was in New York where direct aid totalled \$179,250.65, which was 224.8% more than the Federal W-E.14 expenditures in that state and 18.3% more than total federal expenditures for Project BLR-3-1 in the entire region. Of the total federal expenditures during the current year, 68.6% was used for wages of temporary L/A laborers, 17.2% for non-labor expenses, 10.1% for new automotive equipment, and 4.1% for salaries of three district leaders.

The following table lists all expenditures and contributed services for Project BLR-3-1, by states, during the calendar year 1949.

Table 19 - Total Expenditures and Contributed Services For Work Project BIR-3-1 During Calendar Year 1949

State and Local Cooperative Expenditures and Contributed Services										
State	Cash Expenditures				Value of Contributed Services		Total	B. E. & P. Q. (W. E.-14)	Grand Total	
	State Funds	Towns	Counties	Indiv.	Sub-Total	Contributed Services				
						State				Indiv. & Counties
Maine	\$6,755.56	\$7,992.14	-	-	\$14,747.70	\$790.00	-	\$15,537.70	\$17,365.29	\$32,902.99
N. H.	9,796.21	34,118.04	-	-	43,914.25	2,193.42	-	46,107.67	22,075.91	68,183.58
Vt.	453.09	6,904.95	-	\$67.47	7,425.51	1,277.96	-	8,703.47	16,575.52 ⁽¹⁾	25,278.79
Mass.	9,278.69	60.00	-	29.70	9,368.39	1,600.00	\$19.55 ⁽¹⁾	10,987.94	11,754.00 ⁽⁴⁾	22,741.94
R. I.	1,593.10	-	-	-	1,593.10	170.00	-	1,763.10	1,410.75	3,173.85
Conn.	8,868.79	2,270.28	-	631.30	11,770.37	1,338.96	-	13,109.33	10,031.63	23,140.96
N. Y.	146,419.09	-	29,006.84	124.80	165,550.73	12,859.92	840.66 ⁽²⁾	179,250.65	55,191.80	234,442.45
Penna.	26,552.64	-	-	-	26,552.64	1,020.00	-	27,572.64	11,976.66	39,549.30
All States	\$209,717.17	\$51,345.41	\$9,006.84	\$853.27	\$280,922.69	\$21,250.26	\$859.55	\$303,032.50	\$146,381.36	\$449,413.86

(1) Individuals (2) County (3) Includes \$99. Federal W-A.14 L/A money spent for wages of laborers.

(4) Includes \$70.40 Federal W-A.14 L/A money spent for wages of laborers.

Recapitulation of B.E. and P.Q. Expenditures For Project BIR-3-1 During Calendar Year 1949

State	Salaries of Appointees	L/A Expenditures		Purchase Orders	Total
		Wages of Laborers	Non-Labor Expenses		
Maine	-	\$13,296.10	\$3,021.31	\$1,047.88	\$17,365.29
N.H.	\$1,475.69	12,829.26	4,122.82	3,647.94	22,075.91
Vt.	-	11,574.92	2,765.94	2,234.46	16,575.32
Mass.	-	7,576.76	1,635.28	2,491.96	11,754.00
R.I.	752.69*	579.52	78.54	-	1,410.75
Conn.	2,258.06	3,535.44	1,634.67	2,603.46	10,031.63
N.Y.	1,492.28	44,588.30	7,905.44	1,205.78	55,191.80
Penna.	-	6,450.12	3,922.60	1,603.94	11,976.66
All States	\$5,978.92	\$100,430.42	\$25,136.60	\$14,835.42	\$146,381.36

*One-fourth of District Leader Schreier's W-E.14 salary - remainder charged to Connecticut.

PART IVBLISTER RUST CONTROL WORK ON NATIONAL FORESTS IN NORTHEASTERN REGIONFINANCIAL PROJECT BLR-4

No control work was performed on the three national forests (White Mountain, Green Mountain, and Allegheny) in this region during 1949 and none is deemed essential until the calendar year 1952. Detailed recommendations will be submitted to the Forest Service in due time concerning control needed that year.

The present net control areas on the three national forests aggregate 8,308 acres. All of the initial control work has been completed and approximately 75% of the control areas have been worked twice. The entire control area on the Green Mountain National Forest is on maintenance and 82.6% of the control area on the White Mountain National Forest has been so classified. Only 54.8% of the control area on the Allegheny National Forest is on maintenance, but no work is essential on this forest until 1952. Detailed information on the status of control work on each of these forests as well as accumulative accomplishments and expenditures are shown on Pages 44 to 48 of our 1948 annual report.

PART VBLISTER RUST CONTROL ON NATIONAL PARKS IN NORTHEASTERN REGIONFINANCIAL PROJECT BLR-5

Control activities in cooperation with the National Park Service in this region are restricted to a project at Acadia National Park in Maine. The entire control area, comprising 16,872 acres, had been classified as being on maintenance by the end of 1945. Some maintenance work was performed in 1946 and 1947, but due to the small amount of ribes regrowth found on many of the areas, no further work was recommended for several years.

The control problem on this park was greatly complicated by the devastating forest fire of October, 1947 which burned over nearly 16,000 acres on Mount Desert Island including 8,600 acres, or 51% of the control area in the park. Last year we submitted recommendations to the Park Service officials that a systematic survey be made during the period May 15-August 31, 1950 of the burned areas as well as a check of some of the adjacent unburned areas to determine their status. However, an examination of portions of the burned area during August, 1949 by District Leader Bradbury, K.K. Stimson, Superintendent Hadley, Regional Forester Moore, and three park rangers indicated that such a survey should be postponed until at least 1951. Only one area was found where there was much white pine reproduction which had developed since the fire. Considerable ribes regrowth was found in one area along the lower mountain slopes south of Sieur de Monts spring, but very few bushes were located in the other areas examined. A tentative appointment was made with Messrs. Hadley and Smith for another general examination of the burned areas on the park in October, 1950.

Detailed information on control accomplishments, status of control work, expenditures, etc. is given on Pages 49-51 of our 1948 annual report.

PART VIAPPENDIX

<u>SUMMARIES FOR CALENDAR YEAR 1949</u>	<u>Page</u>
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Control activities in the Northeastern Region during 1949 were restricted to work on state and private lands. Therefore, the summaries in Sections II and III of this report, except for expenditures, represent totals for the region and the data are omitted from this section of the Appendix. Results of important phases of the 1949 control activities are summarized on the following pages:

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Table 20 - Total Expenditures For All Blister Rust Control Activities During Calendar Year 1949

State	Federal (All B.N. & P.Q.)		States and Local Cooperators						Grand Total	
	W.A.-14	W.E.-14	States			Indiv- iduals	Towns	Counties		Total
			Cash	Contributed Services						
Maine	18,991.78	17,365.29	36,357.07	6,755.56	3,190.00	-	7,992.14	-	17,937.70	54,294.77
N.H.	26,684.64	22,075.91	48,760.55	9,796.21	2,493.42	-	34,118.04	-	46,407.67	95,168.22
Vt.	17,383.78	16,476.32	33,860.10	453.09	1,943.96	67.47	6,904.95	-	9,369.47	43,229.57
Mass.	14,456.60	11,683.60	26,140.20	9,278.69	1,600.00	49.25	60.00	-	10,987.94	37,128.14
R.I.	83.77	1,410.75	1,494.52	1,593.10	290.00	-	-	-	1,883.10	3,377.62
Conn.	5,503.74	10,031.63	15,535.37	8,868.79	2,405.66	631.30	2,270.28	-	14,176.03	29,711.40
N.Y.	40,560.65	55,191.80	95,752.45	146,419.09	15,859.92	124.80	-	19,846.84	182,250.65	278,003.10
Penna.	14,864.53	11,976.66	26,841.19	26,552.64	1,271.50	-	-	-	27,824.14	54,665.33
Totals	138,529.49	146,211.96	284,741.45	209,717.17	29,054.46	872.82	51,345.41	19,846.84	310,836.70	595,578.14

Table 20 does not include \$48,199.36 Federal W-A.14 money expended for Cambridge regional office.

Table 21 - Informational and Service Activities of District Blister Rust Control Leaders During Period 1922-1949, Inclusive

Informational Activities

State	Meetings Addressed		Radio Talks*	Items Published	Displays Placed
	Number	Attendance			
Maine	1,433	39,382	-	655	1,153
N.H.	4,106	236,853	-	4,647	2,260
Vt.	1,189	43,155	-	725	1,000
Mass.	1,099	55,323	-	2,180	878
R.I.	280	20,677	-	408	139
Conn.	158	5,963	-	647	195
N.Y.	2,304	184,087	3	3,034	865
Penna.	42	3,953	2	58	99
All States	10,611	589,393	5	12,354	6,589

*No record kept prior to 1949.

Service Activities

State	Initial Interviews	Follow-up Calls	Persons Instructed In Field
Maine	37,793	14,838	23,425
N.H.	43,773	45,043	25,017
Vt.	16,859	13,853	10,574
Mass.	40,072	13,743	12,715
R.I.	4,069	3,324	761
Conn.	6,254	4,067	2,028
N.Y.	41,282	31,083	29,121
Penna.	2,883	602	3,676
All States	192,985	126,553	107,317

Table 22 - Local Cooperation on Blister Rust Control Work, 1918 to 1949, Inclusive
Individual Cooperation

State	No. Cooperators		Amount Spent By Individual Cooperators
	Ribes Erad.	Canker Elimin.	
Maine	11,104	25	\$85,354.48
N. H.	693	-	49,031.17
Vt.	2,357	12	75,280.86
Mass.	21,920	-	114,921.97
R. I.	8	-	581.36
Conn.	523	-	11,933.95
N. Y.	5,984	2	177,035.79
Penna.	303	-	2,273.36
All States	42,892	39	\$516,412.94

Town Cooperation

State	No. Town		Amount Town Money Expended
	Appropriations	Contributions	
Maine	1,122	20	\$185,121.43
N. H.	1,902	20	574,649.70
Vt.	202	64	61,521.20
Mass.	4	61	24,471.76
Conn.	144	51	34,859.12
N. Y.	29	3	9,422.78
All States	3,403	219	\$890,045.99

County Cooperation

State	No. County Appropriations or Allotments	Amount Spent By Counties
N. H.	6	\$1,724.08
N. Y.	132	152,170.35
All States	138	\$153,894.43

Table 23 - Control Area Examination and Mapping Work, 1933-1949, Inclusive

State	Total Acreage Reported Mapped*	Acreage Examined But Not Mapped*	Miles Boundary Lines Painted**	Total Man Days
Maine	2,471,438	4,917,426	1,808	38,633
N.H.	1,957,795	1,011,335	-	46,156
Vt.	1,709,287	4,470,998	828	24,433
Mass.	1,297,660	1,634,778	1,290	22,003
R.I.	305,565	149,741	-	3,039
Conn.	951,972	2,993,428	3,202	27,046
N.Y.	4,832,662	6,363,392	2,403	59,039
Penna.	1,098,805	438,127	7,369	46,150
All States	14,625,184	21,979,225	16,900	266,499

*Total Acreage Reported Mapped includes a large amount of remapping, especially in Vermont, Connecticut, and New York. Also includes areas which were mapped and subsequently discontinued from the control area. Acreage Examined But Not Mapped was largely outside control area and data include two examinations in many instances.

**No record kept of this item after 1945.

Table 24 - Status of Control Area Mapping Work, November 30, 1949

State	Total Acreage of Present Net Control Area	Acreage Detail Mapped in Net Control Area	% Net Control Area Detail Mapped
Maine	2,458,529	2,148,804	87.4
N.H.	2,839,908	1,565,996	55.8
Vt.	717,348	709,336	98.9
Mass.	1,535,338	1,030,902	67.1
R.I.	141,808	127,404	89.8
Conn.	449,215	449,215	100.0
N.Y.	2,591,145	2,044,483	78.9
N.J.	16,742	0	0
Penna.	612,521	583,504	95.3
All States	11,362,554	8,679,644	76.4

Table 25 - Nursery Sanitation Work, 1930-1949, Inclusive

State	Type of Work	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre	
			Wild & Cult.	Cult. Only		Ribes	Man Days
Maine	Initial	206	103,538	22	163	502.6	.79
	Rework	1,529	10,819	-	300	7.1	.20
	Total	1,735	114,357	22	463	65.9	.27
N.H.	All Rework	3,055	7,826	1	285	2.6	.09
Vt.	" "	2,563	4,961	75	412	1.9	.16
Mass.	Initial	783	30,558	112	147	39.0	.19
	Rework	7,370	19,467	182	1,123	2.6	.15
	Total	8,153	50,025	294	1,270	6.1	.16
R.I.	Initial	1,780	725	565	167	0.4	.09
	Rework	18,156	4,970	184	277	0.3	.02
	Total	19,936	5,695	749	444	0.3	.02
Conn.	Initial	7,683	16,934	165	335	2.2	.04
	Rework	64,965	18,946	980	2,600	0.3	.04
	Total	72,648	35,880	1,145	2,935	0.5	.04
N.Y.	Initial	3,735	31,579	655	424	8.5	.11
	Rework	122,383	136,724	1,246	6,297	1.1	.05
	Total	126,118	168,303	1,901	6,721	1.3	.05
N.J.	Initial	795	2,114	114	109	2.7	.14
	Rework	1,050	765	-	19	0.7	.02
	Total	1,845	2,879	114	128	1.6	.07
Penna.	Initial	4,414	38,954	494	343 $\frac{1}{2}$	8.8	.08
	Rework	29,913	64,574	73	4,171 $\frac{1}{2}$	2.2	.14
	Total	34,327	103,528	567	4,515	3.0	.13
All States	Initial	19,396	224,402	2,127	1,688 $\frac{1}{2}$	11.6	.09
	Rework	250,984	269,052	2,741	15,484 $\frac{1}{2}$	1.1	.06
	Total	270,380	493,454	4,868	17,173	1.8	.06

Prior to 1930, results of nursery sanitation work were included with data for regular control activities.

Table 26 - Status of Nursery Sanitation Work, December 31, 1949

State	Nurseries Where Protection Established and Being Maintained				Acreage of Control Areas	No. Nurseries Protected During 1949	No. Additional Nurseries Which Established Zones But Now Abandoned
	Number						
	Federal	State	Private	Total			
Maine	-	1	1	2	473	-	5
N.H.	-	1	1	2	749	-	1
Vt.	-	1	-	1	333	-	-
Mass.	-	4	2	6	1,485	-	14
R.I.	-	-	-	-	-	-	6
Conn.	-	1	2	3	1,036	3	18
N.Y.	1	4	-	5	4,366	5	3
N.J.	-	1	-	1	600	-	1
Penna.	-	5	3	8	3,921	1	6
All States	1	18	9	28	12,963	9	54

Table 27 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region
December 31, 1949

	Acreage of Sanitation Zone
<u>Maine</u>	
Western Maine Nursery - Fryeburg, Maine.....	311
State Nursery - Orono, Maine.....	162
	473
<u>New Hampshire</u>	
Keene Forestry Associates - Keene, N.H.	250
State Nursery - Boscawen, N.H.	499
	749
<u>Vermont</u>	
State Nursery - Essex Junction, Vt.	333
<u>Massachusetts</u>	
Department of Conservation Nursery - Amherst, Mass.	225
Department of Conservation Nursery - Bridgewater, Mass.	100
Department of Conservation Nursery - Clinton, Mass.	150
Department of Conservation Nursery - Erving, Mass.	50
Kelsey Highlands Nursery - Boxford, Mass.	900
Weston Nursery - Weston, Mass.	60
	1,485
<u>Connecticut</u>	
Northeastern Forestry Company - Cheshire, Conn.	356
State Nursery - Barkhamstead, Conn.	492
Great Pond Nursery - Simsbury, Conn.	188
	1,036

Table 27 - List of Nurseries Maintaining Sanitation Zones in Northeastern Region (Continued)
December 31, 1949

	<u>Acreage of Sanitation Zone</u>
<u>New York</u>	
State Nursery - Saratoga Springs, N.Y. (old portion.....	705
(new portion.....	1,605
State Nursery - Lowville, N.Y.	1,150
N.Y. State College of Forestry Nursery - Syracuse, N.Y.	230
State Nursery (Division of Fish and Game) - Painted Post, N.Y.	206
Soil Conservation Service Nursery - Big Flats, N.Y.	470
	<u>4,366</u>
<u>New Jersey</u>	
State Nursery - Washington Crossing, N.J.	600
<u>Pennsylvania</u>	
Clearfield State Nursery - Clearfield, Penna.	370
Greenwood State Nursery - Petersburg, Penna.	411
Mt. Alto State Nursery - Mt. Alto, Penna.	366
Rockview State Nursery - Pleasant Gap, Penna.	354
Howard State Nursery - Mt. Eagle, Penna.	215
Andorra Nursery - Chester Hill, Penna.	1,065
Fairview Nursery - Fairview, Penna.	559
Doyle Nursery - Seven Stars, Penna.	581
	<u>3,921</u>
<u>All States</u>	
28 Nurseries.....	12,963

Table 28 - Special Ribes Nigrum Elimination Work, 1928-1949, Inclusive - By States

State	No. Properties Inspected	No. Patches Located	No. Ribes Destroyed			Total Man Days
			Nigrum	Other Cult.	Total	
Mass.	750,359	6,657	42,629*	432	43,061	7,347
R. I.	110,137	1,917	16,219	1,093	17,312	1,929
Conn.	318,344	32,695**	7,464	42,397	49,861	14,610
N. Y.	526,593	5,128	37,064	761	37,825	5,250
All States	1,705,433	46,397	103,376	44,683	148,059	29,136

*Includes 556 bushes pulled in connection with special black currant elimination project around nurseries in 1925 and 1926.

**The survey in Connecticut included all cultivated ribes. It is estimated that the number of black currant patches in that state did not exceed 1500.

Table 29 - Status of Special Ribes Nigrum Elimination Work - December 31, 1949

State	Years Work Performed	Total Number Townships in State	No. Townships Where Special Black Currant Elimination Work	
			Completed	Partially Completed
Mass.	1930-1940, Incl.	355	346*	-
R. I.	1929-1933 "	39	39	-
Conn.	1930-1935 "	169	169	-
N. Y.	1928-1940 "	996	236	39
All States	-	1,559	790	39

*Nine additional townships on islands next to mainland will not be worked.

In the other states, Ribes nigrum have been eradicated in the worked portions of the control areas in conjunction with regular control activities. Very few black currants have been found in these states.

Table 30 - Blister Rust Canker Elimination Work, 1932-1949, Inclusive

State	Ownership Class	Total Number Pines Examined	Number Fatally Infected Pines Cut Down	No. Additional Infected Pines From Which Cankers Removed	Total Number Cankers Removed	Total Man Days
Maine	State & Private	95,207	7,950	12,091	19,901	713
	Acadia Nat. Park	61,572	3,376	9,924	32,336	2,476
	Total	156,779	11,326	22,015	52,237	3,189
N.H.	All State & Private	28,581	5,731	638	711	219
Vt.	"	272,593	40,924	21,389	25,264	3,047
Mass.	"	4,778,017	32,416	16,699	22,451	8,762
N.Y.	"	1,970,284	163,215	202,951	274,734	14,606
Penna.	"	919,698	32,670	130,020	569,029	7,312
All States	State & Private	8,064,380	282,906	383,788	912,090	34,659
	National Park	61,572	3,376	9,924	32,336	2,476
	Total	8,125,952	286,282	393,712	944,426	37,135

Table 31 - State Compensation Paid For Cultivated Ribes Destroyed, 1918 to 1949, Inclusive

State	Total No. Cult. Ribes Destroyed	No. Bushes Paid For	% Bushes Paid For	No. Persons Paid Compensation	Amount Paid in Reimbursement	Average Amount Paid Per Bush
Maine	160,404	0	0	0	0	0
N.H.	161,479	2,008	1.2	63	\$550.60	\$.274
Vt.	18,476	1,646	8.9	133	792.91	.482
Mass.	333,096	42,098	12.6	674	15,029.75	.357
R.I.	41,943	1,410	3.4	58	509.79	.362
Conn.	90,700	175	0.2	16	103.50	.591
N.Y.	191,457	16,340	8.5	1152	5,590.99	.342
N.J.	1,842	0	0	0	0	0
Penna.	62,659	517	0.8	71	167.75	.342
All States	1,062,056	64,194	6.0	2,167	\$22,745.29	\$.354

No federal money has been spent for ribes compensation.

Table 32 - Ribes Eradication Work, 1918-1949, Inclusive
By States

State	Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
					Ribes	Man Days	
Maine	First	2,547,585	47,192,993	261,743	18.5	.103	9.7
	Second	1,282,958	14,690,936	158,332	11.4	.123	8.1
	Other	187,683	377,617	4,511	2.0	.024	41.6
	Total	4,018,226	62,261,546	424,586	15.5	.106	9.5
N.H.	First	3,309,033	57,899,255	311,327	17.5	.094	10.6
	Second	1,253,894	13,519,030	132,630	10.8	.106	9.5
	Other	140,193	688,278	11,305	4.9	.081	12.4
	Total	4,703,120	72,106,563	455,262	15.3	.097	10.3
Vt.	First	648,986	12,700,948	130,288	19.6	.201	5.0
	Second	266,047	3,249,995	49,471	12.2	.186	5.4
	Other	29,851	140,537	3,089	4.7	.103	9.7
	Total	944,884	16,091,480	182,848	17.0	.194	5.2
Mass.	First	2,116,125	16,968,410	132,432	8.0	.063	16.0
	Second	1,250,656	6,143,044	99,636	4.9	.080	12.6
	Other	136,200	213,829	5,526	1.6	.041	24.6
	Total	3,502,981	23,325,283	237,594	6.7	.068	14.7
R.I.	First	330,050	269,502	21,251	0.8	.064	15.5
	Second	315,111	377,557	53,704	1.2	.170	5.9
	Other	83,999	18,311	2,788	0.2	.033	30.1
	Total	729,160	665,370	77,743	0.9	.107	9.4
Conn.	First	444,293	2,496,108	39,773	5.6	.090	11.2
	Second	446,647	4,888,040	92,929	10.9	.208	4.8
	Other	276,956	387,251	7,507	1.4	.027	36.9
	Total	1,167,896	7,771,399	140,209	6.7	.120	8.3
N.Y.	First	2,929,393	66,973,669	727,274	22.9	.248	4.0
	Second	1,723,775	13,868,499	227,463	8.0	.132	7.6
	Other	939,807	2,225,700	42,326	2.4	.045	22.2
	Total	5,592,975	83,067,868	997,063	14.9	.178	5.6
N.J.	First	16,742	49,493	1,324	3.0	.079	12.6
	Second	1,417	16,971	392	12.0	.277	3.6
	Total	18,159	66,464	1,716	3.7	.094	10.6
Penna.	First	732,594	33,883,814	332,598	46.3	.454	2.2
	Second	378,149	6,154,618	164,387	16.3	.435	2.3
	Other	112,869	349,081	5,716	3.1	.051	19.7
	Total	1,223,612	40,387,513	502,701	33.0	.041	2.4
All States	First	13,074,801	238,434,192	1,958,010	18.2	.150	6.7
	Second	6,918,654	62,908,690	978,944	9.1	.141	7.1
	Other	1,907,558	4,400,604	82,768	2.3	.043	23.0
	Total	21,901,013	305,743,486	3,019,722	14.0	.138	7.3

Table 33 - Ribes Eradication Work, 1918-1949, Inclusive
(By Land Ownership Classes)

Ownership Class		Type of Work	Gross Acreage Reported Worked	No. Ribes Destroyed (Wild & Cult.)	Total Man Days	Per Acre		Acres Worked Per Man Day
						Ribes	Man Days	
State and Privately Owned Lands		First	13,038,649	235,900,429	1,940,594	18.1	.149	6.7
		Second	6,889,611	62,425,812	971,885	9.1	.141	7.1
		Other	1,892,720	4,366,253	81,576	2.3	.043	23.2
		Total	21,820,980	302,692,494	2,994,055	13.9	.137	7.3
Adams National Park		First	20,716	893,940	11,227	43.2	.542	1.8
		Second	18,159	59,356	4,450	3.3	.245	4.1
		Other	8,207	6,100	656	0.7	.080	12.5
		Total	47,082	959,396	16,333	20.4	.347	2.9
National Forests	White Mountain	First	9,529	817,694	2,957	85.8	.310	3.2
		Second	7,843	323,774	1,854	41.3	.236	4.2
		Other	5,317	11,238	253	2.1	.048	21.0
		Total	22,689	1,152,706	5,064	50.8	.223	4.5
	Green Mountain	First	458	3,298	31	7.2	.068	14.8
		Second	115	252	12	2.2	.104	9.6
		Total	573	3,550	43	6.2	.075	13.3
	Allegheny	First	5,449	818,831	3,201	150.3	.587	1.7
		Second	2,926	99,496	743	34.0	.254	3.9
		Other	1,314	17,013	283	12.9	.215	4.6
		Total	9,689	935,340	4,227	96.5	.436	2.3
	Total	First	15,436	1,639,823	6,189	106.2	.401	2.5
		Second	10,884	423,522	2,609	38.9	.240	4.2
		Other	6,631	28,251	536	4.3	.081	12.4
		Total	32,951	2,091,596	9,334	63.5	.283	3.5
	All Classes		First	13,074,801	238,434,192	1,958,010	18.2	.150
Second			6,918,654	62,908,690	978,944	9.1	.141	7.1
Other			1,907,558	4,400,604	82,768	2.3	.043	23.0
Total			21,901,013	305,743,486	3,019,722	14.0	.138	7.3

Table 34 - Ribes Eradication Work on Maintenance Areas, 1946-1949, Inclusive
(No separate record kept of such work prior to 1946)

State	Land Ownership Class	Acreage Worked	No. Ribes Destroyed		Total Man Days	Per Acre		Acres Worked Per Man Day
			Wild & Cult.	Cult. Only		Ribes	Man Days	
Maine	State & Private	12,746	10,585	10	208	0.8	.016	61.3
	Acadia Nat. Park	8,829	1,162	0	247	0.1	.028	35.7
	Total	21,575	11,747	10	455	0.5	.021	47.4
N.H.	State & Private	5,846	11,298	126	206	1.9	.035	28.4
	White Mt. Nat. Forest	300	0	0	4	0	.013	75.0
	Total	6,146	11,298	126	210	1.8	.034	29.3
Vt.	All State & Private	1,766	2,584	0	51	1.5	.029	34.6
R.I.	"	69,190	11,922	166	1,198	0.2	.017	57.8
Conn.	"	197,512	283,893	0	4,034	1.4	.020	49.0
N.Y.	"	198,860	292,377	258	6,124	1.5	.031	32.5
Penna.	"	39,360	27,670	92	797	0.7	.020	49.4
All States	State & Private	525,280	640,329	652	12,618	1.2	.024	41.6
	National Forest	300	0	0	4	0	.013	75.0
	National Park	8,829	1,162	0	247	0.1	.028	35.7
	Total	534,409	641,491	652	12,869	1.2	.024	41.5

TABLE 35 - STATUS OF BLISTER RUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND DISTRICTS
(November 30, 1949)

State	District	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage in Control Area			Percentage of Control Area							In Need of Pre- Maintenance Work	
					Pre-Maintenance Work			Mainten- ance Work	In Need of Pre-Maintenance Work		Detail Mapped	Worked			On Main- tenance					
					First	Second	Other		First	Rework		Pre-Maintenance		Main- tenance						
												First	Second			Other				
Maine	Bradbury	796,298	239,697	760,283	669,312	283,921	60,087	18,275	126,986	371,103	95.5	84.1	35.7	7.5	2.3	37.4	5.9	46.6		
	Calderara	790,680	311,777	721,216	737,075	449,645	29,340	1,879	53,605	544,210	91.2	93.2	56.9	3.7	0.2	24.4	6.8	68.8		
	Pike	871,551	411,441	667,305	871,551	565,903	73,202	1,421	0	470,550	76.6	100.0	64.9	9.1	0.2	46.0	0	54.0		
	Totals For State	2,458,529	962,915	2,148,804	2,277,938	1,299,469	168,629	21,575	892,075	1,385,863	87.4	92.7	52.9	6.9	0.9	36.3	7.3	56.4		
New Hampshire	Baker	552,324	248,342	271,462	531,939	270,627	30,344	0	20,385	381,596	49.1	96.3	49.0	5.5	0	27.2	3.7	69.1		
	Boomer	340,962	130,418	340,962	340,731	142,713	6,584	300	231	254,909	100.0	99.9	41.9	1.9	0.1	25.2	0.1	74.7		
	Codman	175,188	91,985	173,306	174,167	138,392	34,783	3,500	1,021	75,451	98.9	99.4	79.0	19.9	2.0	56.3	0.6	43.1		
	Curtis	668,400	303,575	179,469	637,754	197,024	13,476	0	30,646	462,799	26.8	95.4	29.5	2.0	0	26.2	4.6	69.2		
Vermont	King	767,756	371,761	367,259	748,479	293,827	34,796	0	13,277	620,488	47.8	97.5	38.3	4.5	0	16.7	2.5	80.8		
	Richardson	335,278	138,164	253,538	290,552	107,489	7,166	2,346	44,726	206,805	75.6	86.7	32.1	2.1	0.7	25.0	13.3	61.7		
	Totals For State	2,839,908	1,284,245	1,585,996	2,723,622	1,150,072	127,149	6,146	721,574	2,002,048	55.8	95.9	40.5	4.5	0.2	25.4	4.1	70.5		
	Mulholland	224,360	46,051	224,300	155,541	84,217	6,253	0	31,290	124,251	99.9	64.3	37.5	2.8	0	13.9	30.7	55.4		
Mass.	Palmer	188,023	44,737	187,343	141,762	42,908	4,970	28	46,261	49,066	99.6	75.4	22.8	2.6	.01	49.3	24.6	26.1		
	Rose	304,965	70,721	297,693	264,830	125,237	14,794	1,738	40,135	92,935	97.6	86.8	41.1	4.9	0.6	56.4	13.2	30.4		
	Totals For State	717,348	161,509	709,336	562,133	252,362	26,017	1,766	295,881	266,252	98.9	78.4	35.2	3.6	0.2	41.3	21.6	37.1		
	Brockway	502,885	220,791	423,157	480,166	279,337	16,676	0	253,421	226,745	84.1	95.5	55.5	3.3	0	50.4	4.5	45.1		
R.I.	Doore	429,360	130,336	343,304	424,477	351,051	95,859	0	4,883	181,802	80.0	98.9	81.8	22.3	0	56.5	1.1	42.4		
	Eastern District	603,093	223,708	264,441	601,910	465,382	22,217	0	587,922	13,988	43.8	99.8	77.2	3.7	0	97.5	0.2	2.3		
	Totals For State	1,535,338	574,835	1,030,902	1,506,553	1,095,770	134,752	0	1,084,018	422,535	67.1	98.1	71.4	8.8	0	70.6	1.9	27.5		
	Schreier	141,808	62,020	127,404	141,808	135,925	34,068	66,573	0	0	89.8	100.0	95.9	24.0	46.9	100.0	0	0		
Conn.	Miller	178,405	35,731	178,405	176,910	154,940	56,832	96,330	0	0	100.0	100.0	86.8	31.9	54.0	100.0	0	0		
	Schraier	182,712	45,900	182,712	182,712	150,891	72,811	93,894	0	0	100.0	100.0	82.6	39.8	51.4	100.0	0	0		
	Remainder of State	88,098	7,686	88,098	88,098	1,365	0	11,841	0	0	100.0	100.0	1.5	0	13.4	100.0	0	0		
	Totals For State	449,215	89,317	449,215	449,215	307,196	129,643	202,065	449,215	0	0	100.0	100.0	68.4	28.9	45.0	100.0	0	0	
New York	Barber	372,882	128,435	372,882	347,077	284,579	148,900	63,800	25,805	212,387	100.0	93.1	76.3	39.3	17.1	36.1	4.9	57.0		
	Charlton	180,600	49,409	179,670	176,910	124,435	54,395	8,225	3,690	91,630	99.5	98.0	68.9	30.1	4.5	47.2	2.0	50.8		
	Harpp	557,952	262,896	539,646	556,188	519,531	270,310	84,209	1,764	302,570	96.7	99.7	93.1	48.4	15.1	45.5	0.3	54.2		
	Hick	205,709	43,973	199,384	197,939	140,200	46,822	18,150	7,770	126,395	96.9	96.2	68.2	22.8	8.8	34.8	3.8	61.4		
	Holcomb	239,412	68,275	201,047	229,457	179,057	86,550	20,330	9,955	168,387	84.0	95.8	74.8	36.2	8.5	25.5	4.2	70.3		
	Lilley	234,618	47,664	205,033	208,185	117,705	27,220	5,855	26,433	170,769	87.4	88.7	50.2	11.6	2.5	15.9	11.3	72.8		
	Sievers	305,260	76,659	210,460	282,087	73,742	12,983	0	23,173	131,228	68.9	92.4	24.2	4.3	0	49.4	7.6	43.0		
	Woolschlager	257,205	72,061	125,877	249,300	132,555	34,976	1,000	7,905	191,582	48.9	96.9	51.5	13.6	0.4	22.8	3.1	74.5		
N.J.	Sub-Totals For Present Districts	2,353,638	749,372	2,033,999	2,247,143	1,571,804	682,156	201,569	106,495	1,394,948	86.4	95.5	66.8	29.0	8.6	36.2	8.5	59.3		
	Counties Outside Present Districts (1)	237,507	43,362	10,484	174,353	70,231	2,461	1,669	63,154	123,776	4.4	73.4	29.6	1.0	0.7	21.4	46.8	52.1		
	Totals For State	2,591,145	792,734	2,044,483	2,421,496	1,642,035	684,617	203,238	902,772	1,518,724	78.9	93.5	63.4	26.4	7.8	34.3	0.2	51.8		
	" " "	16,742	3,771	0	16,742	1,417	0	0	0	0	0	100.0	8.5	0	0	0	100.0	0	0	
Penna.	DeBerti	194,129	33,663	188,967	172,214	77,048	13,604	1,638	21,915	65,118	97.3	88.7	39.7	7.0	0.8	55.2	31.3	33.5		
	Fatzinger	224,525	53,828	201,178	188,412	94,223	31,380	4,546	36,113	107,220	89.6	83.9	42.0	14.0	2.0	36.2	16.1	47.7		
All States	Simmonds	193,867	38,821	193,359	184,878	88,069	16,651	32,381	8,989	64,578	99.7	95.4	45.4	8.6	16.7	62.1	6.6	31.3		
	Totals For State	612,521	126,312	583,504	545,504	259,740	61,635	38,565	67,017	236,916	95.3	89.1	42.3	10.1	6.3	50.4	10.9	38.7		
	-	11,362,554	4,057,658	8,679,644	10,645,011	6,143,586	1,366,510	539,928	717,543	5,832,338	76.4	93.7	54.1	12.0	4.8	42.4	6.3	54.3		

(1) Since October, 1948 a state employee has been assigned to this district in western New York.

TABLE 36. STATUS OF ELISTER HUST CONTROL WORK IN PRESENT NET CONTROL AREA IN NORTHEASTERN REGION BY STATES AND LAND OWNERSHIP CLASSES
(November 30, 1949)

State	Land Ownership Class	Total Acreage	Acreage of White Pine	Acreage Detail Mapped	Net Acreage Worked				Acreage in Control Area			Percentage of Control Area Worked							In Need of Pre-Maintenance Work	
					Pre-Maintenance Work			Maintenance Work	Now on Maintenance Basis	Pre-Maintenance Work		Detail Mapped	Pre-Maintenance Worked			On Maintenance	In Need of Pre-Maintenance Work			
					First	Second	Other			First	Second		Other	First	Second		Other	First	Rework	
Maine	State & Private	2,440,501	959,347	2,147,648	2,259,910	1,287,725	163,222	12,745	874,705	180,591	1,385,205	88.0	92.6	52.8	6.7	0.5	35.8	7.4	56.8	
	White Mt. Nat. Forest	1,156	368	1,156	1,156	473	428	0	498	0	658	100.0	100.0	40.9	37.0	0	43.1	0	56.9	
	Acadia Nat. Park	16,872	3,200	0	16,872	11,271	4,979	8,829*	16,872	0	0	0	100.0	66.8	29.5	52.3	100.0	0	0	
	Total	2,458,529	962,915	2,148,804	2,277,938	1,299,469	168,629	21,575	892,075	180,591	1,385,863	87.4	92.7	52.9	6.9	0.9	36.3	7.3	56.4	
N.H.	State & Private	2,836,874	1,283,265	1,582,962	2,720,588	1,147,088	124,766	5,846	718,610	116,286	2,001,978	55.8	95.9	40.4	4.4	0.2	25.3	4.1	70.6	
	White Mt. Nat. Forest	3,034	980	3,034	3,034	2,984	2,383	300	2,964	0	70	100.0	100.0	98.4	78.6	9.9	97.7	0	2.3	
	Total	2,839,908	1,284,245	1,585,996	2,723,622	1,150,072	127,149	6,146	721,574	116,286	2,002,048	55.8	95.9	40.5	4.5	0.2	25.4	4.1	70.5	
	State & Private	715,775	161,420	708,823	561,560	252,247	26,017	1,766	295,308	155,215	266,252	98.9	78.3	35.2	3.6	0.2	41.2	21.7	37.1	
Vt.	Green Mt. Nat. Forest	573	89	513	573	115	0	0	573	0	0	89.5	100.0	20.1	0	0	100.0	0	0	
	Total	717,348	161,509	709,336	562,133	252,362	26,017	1,766	295,881	155,215	266,252	98.9	78.4	35.2	3.6	0.2	41.3	21.6	37.1	
Mass.	All State & Private	1,535,338	574,835	1,030,902	1,506,553	1,095,770	134,752	0	1,084,018	28,785	422,535	67.1	98.1	71.4	8.8	0	70.6	1.9	7.5	
R.I.	"	141,808	62,020	127,404	141,808	135,925	34,068	66,573	141,808	0	0	89.8	100.0	95.9	24.0	46.9	100.0	0	0	
Conn.	"	449,215	89,317	449,215	449,215	307,196	129,643	202,065	449,215	0	0	100.0	100.0	68.4	28.9	45.0	100.0	0	0	
N.Y.	"	2,591,145	792,734	2,044,483	2,421,496	1,642,035	684,617	203,238	902,772	169,649	1,518,724	78.9	93.5	63.4	26.4	7.8	34.3	6.5	38.6	
N.J.	"	16,742	3,771	0	16,742	1,417	0	0	16,742	0	0	0	100.0	8.5	0	0	100.0	0	0	
Penna.	State & Private	608,976	125,508	579,959	541,959	256,650	60,321	38,565	306,645	67,017	235,314	95.2	89.0	42.1	9.9	6.3	50.4	11.0	38.6	
	Allegheny Nat. Forest	3,545	804	3,545	3,545	2,690	1,314	0	1,943	0	1,602	100.0	100.0	75.9	37.1	0	4.8	0	45.2	
	Total	612,521	126,312	583,504	545,504	259,340	61,635	38,565	308,588	67,017	236,916	95.3	89.1	42.3	10.1	6.3	50.4	10.9	36.7	
All States	State & Private	11,337,374	4,052,217	8,671,396	10,619,831	6,126,053	1,357,406	530,799	4,789,823	717,543	5,830,008	76.5	93.7	54.0	12.0	4.7	42.2	6.1	51.5	
	National Forests	8,308	2,241	8,248	8,308	6,262	4,125	300	5,978	0	2,330	99.3	100.0	75.4	49.6	3.6	72.0	0	28.0	
	National Park	16,872	3,200	0	16,872	11,271	4,979	8,829	16,872	0	0	0	100.0	66.8	29.5	52.3	100.0	0	0	
	Total	11,362,554	4,057,658	8,679,644	10,645,011	6,143,586	1,366,510	539,928	4,812,673	717,543	5,832,338	76.4	93.7	54.1	12.0	4.8	42.4	6.1	51.3	

*Includes 5,601 acres which were placed on maintenance after first working.

Table 37 - Total Expenditures For Blister Rust Control
in Northeastern Region During Period 1935-1949

State			Maine	N.H.	Vt.	Mass.	N.J.		
State and Local Cooperation	State		209,634.80	381,559.70	78,773.80	362,083.24	100,471.94		
	Individuals		85,354.48	49,031.17	75,280.86	114,921.97	441.1		
	Towns		185,121.43	574,613.70	61,521.20	24,471.76	-		
	Counties		-	1,724.03	-	-	-		
	Total		480,160.71	1,005,964.65	215,575.86	501,476.97	101,082.74		
Federal Funds	Special	B.F.I.		249,874.54	434,415.50	119,398.94	323,303.88	43,883.8	
		B. S. A.	W.A.-14	214,359.87	243,762.02	157,172.51	154,774.03	9,342.1	
			N.H.-14	194,931.88	215,482.54	121,707.03	97,897.49	11,798.1	
		P. Q.	Total	409,231.45	456,814.56	278,479.54	292,671.52	26,978.2	
		Forest Service		771.06	3,890.28	292.65	-	-	
	Park Service		23,593.51	-	-	-	-		
	Sub-Total		683,530.56	894,150.32	398,171.13	615,975.40	70,882.3		
	Emergency	C.C.O.		355,610.43	149,340.77	95,905.47	64,503.64	111,445.1	
		P.W.A.		69,128.95	68,547.21	32,168.20	52,071.59	12,407.2	
		W.F.A. (State)		6,597.97	20,595.37	8,685.80	17,413.66	2,700.2	
		W.P.A. (F.A.)		649,730.76	672,425.87	402,140.28	407,457.56	42,051.3	
		C.W.A.		-	-	-	31,334.01	-	
		M.R.A.		1,426.80	-	-	10,999.20	-	
		A.R.A.		-	-	-	-	1,541.1	
		S.O.B.		-	-	-	-	5,797.1	
		W.Y.A. & N.V.S.		-	-	-	-	-	
		Sub-Total		1,052,454.91	870,952.22	575,899.75	583,579.03	142,188.2	
		Total Federal Funds			1,765,025.47	1,765,112.54	937,070.88	1,199,554.43	283,070.5
		Grand Total			2,246,186.18	2,771,077.19	1,152,646.74	1,701,031.40	384,153.24
Percentage of Total			13.3	16.1	6.6	10.0	2.2		

Table 37 does not include any expenditures for regional office. Such expenditures during 1935-1949 were as follows: B.S. and F.Q. funds - \$367,860.36; W.P.A. project funds - \$55,107.20; W.P.A. administrative funds - \$34,402.59; total - \$457,370.15. No record available at Cambridge of Bureau of Plant Industry and P.W.A. expenditures for regional office prior to July 1, 1935.

Continuing Expenditures
1935-1949

	N.Y.	N.J.	Penna.	All States
1935	1,959,857.70	16,828.15	224,796.92	3,544,764.83
1936	177,035.79	-	2,273.36	516,412.94
1937	9,422.78	-	-	890,045.99
1938	152,170.35	-	-	153,694.43
1939	2,295,526.62	16,828.15	227,070.28	5,105,118.19
1940	479,759.34	6,271.28	31,619.21	1,791,601.66
1941	230,253.23	2,949.64	147,799.70	1,326,727.25
1942	504,956.83	-	101,687.25	1,310,622.69
1943	795,210.06	2,949.64	249,486.95	2,637,349.94
1944	-	-	3,909.77	8,863.74
1945	-	-	5,488.05	29,197.59
1946	1,274,379.40	9,220.92	290,614.01	4,467,006.95
1947	774,782.95	346.50	835,066.17	2,624,455.52
1948	92,334.23	3,081.45	45,474.63	397,763.96
1949	23,587.53	-	23,507.24	335,778.97
1950	1,132,151.77	7,303.37	455,814.65	3,818,439.90
1951	-	-	-	37,072.18
1952	2,779.70	-	-	103,683.10
1953	8,010.58	-	4,254.65	15,057.94
1954	9,087.87	230.25	9,613.27	24,728.58
1955	812.40	-	220.80	1,033.20
1956	2,043,547.03	10,961.60	1,433,951.41	7,364,013.35
1957	3,318,526.43	20,182.52	1,724,565.42	11,831,020.30
1958	5,617,053.05	37,010.67	1,951,635.70	16,936,136.49
1959	33.2	0.2	11.5	100.0

Period July 1, 1935 to December 31, 1949 were as follows:
B.S. - \$34,402.59; total - \$487,370.15. No record available prior to July 1, 1935.



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Report
ON
WHITE PINE BLISTER RUST CONTROL
SOUTHERN APPALACHIAN REGION
1949

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Administration
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
Southern Appalachian Regional Office
Box No. 507
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February 1950

ANNUAL REPORT

ON

WHITE PINE BLISTER RUST CONTROL

SOUTHERN APPALACHIAN REGION

1949

United States Department of Agriculture
Bureau of Entomology and Plant Quarantine
Box #507
Room 207, Federal Building
Harrisburg, Virginia

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PART I

REPORT OF DISTRICT BEST CONTROL

IN

THE SOUTHERN APPALACHIAN REGION

1943

FOREWORD

This annual report is prepared in much the same manner as those previously submitted, namely the first section deals primarily with the region as a whole; Part II pertains to State and Private lands and is arranged by States; Parts 3 and 4 deal with the National Forests and National Parks respectively and, where the problems vary, are discussed on the basis of each forest and park. Statistics pertaining to each section are given generally in a few condensed tables which deal with the current years work by operating agency and by ownership, and others with the status of the work as of the end of 1949.

A large portion of the years summary was requested by our Washington office for a special purpose early in December. The records are, therefore, closed at the end of November. This report deals, for the most part, with only eleven months of 1949. Very little work is underway during December except some survey which will be included with 1950 in all of the records.

Status of Blister Rust

Blister rust was reported in 1949 for the first time on ribes in Union County, Tennessee; Jackson and Macon Counties, North Carolina; and Union County, Georgia. This is the first time the disease has been reported in Georgia. It has now been found on one or both host plants in all States in the region except South Carolina and Kentucky. It was reported for the first time on white pine in Randolph County, West Virginia and Buncombe, Haywood and Yancey Counties, North Carolina. The infection in Haywood County, North Carolina is within the boundaries of the Great Smoky Mountains National Park. This is a very light infection. The infection in ~~Yancey~~ Yancey County, North Carolina was on Pinus monticola and is in an experimental plantation near Mount Mitchell. The infection in Buncombe County was of slight extent and in the general vicinity of Craggy Pinnacles.

The rust was also found on ribes in several other counties in western North Carolina and eastern Tennessee. It appears to be well established in widely scattered infections throughout most of that part of the region where we have white pine and ribes in association. Practically all of the pine infection found to date south of Virginia was outside of established control areas. Very little damage has occurred anywhere in the region except in western Maryland and the northern half of Virginia and West Virginia. The map on page 5 shows the distribution of the rust in the region.

White Pine Survey

White pine survey was conducted in Tennessee, North Carolina, Virginia and West Virginia. The resurvey of the counties which we have pin- and ribes in association is practically completed except in Virginia, North Carolina and a small part of West Virginia. Small survey jobs will continue to be found necessary as long as the program operates because of the rapid spread of white pine. This should be a relatively minor job in the overall program after about 1950. The following table gives a resume of the survey work this year.

TABLE I

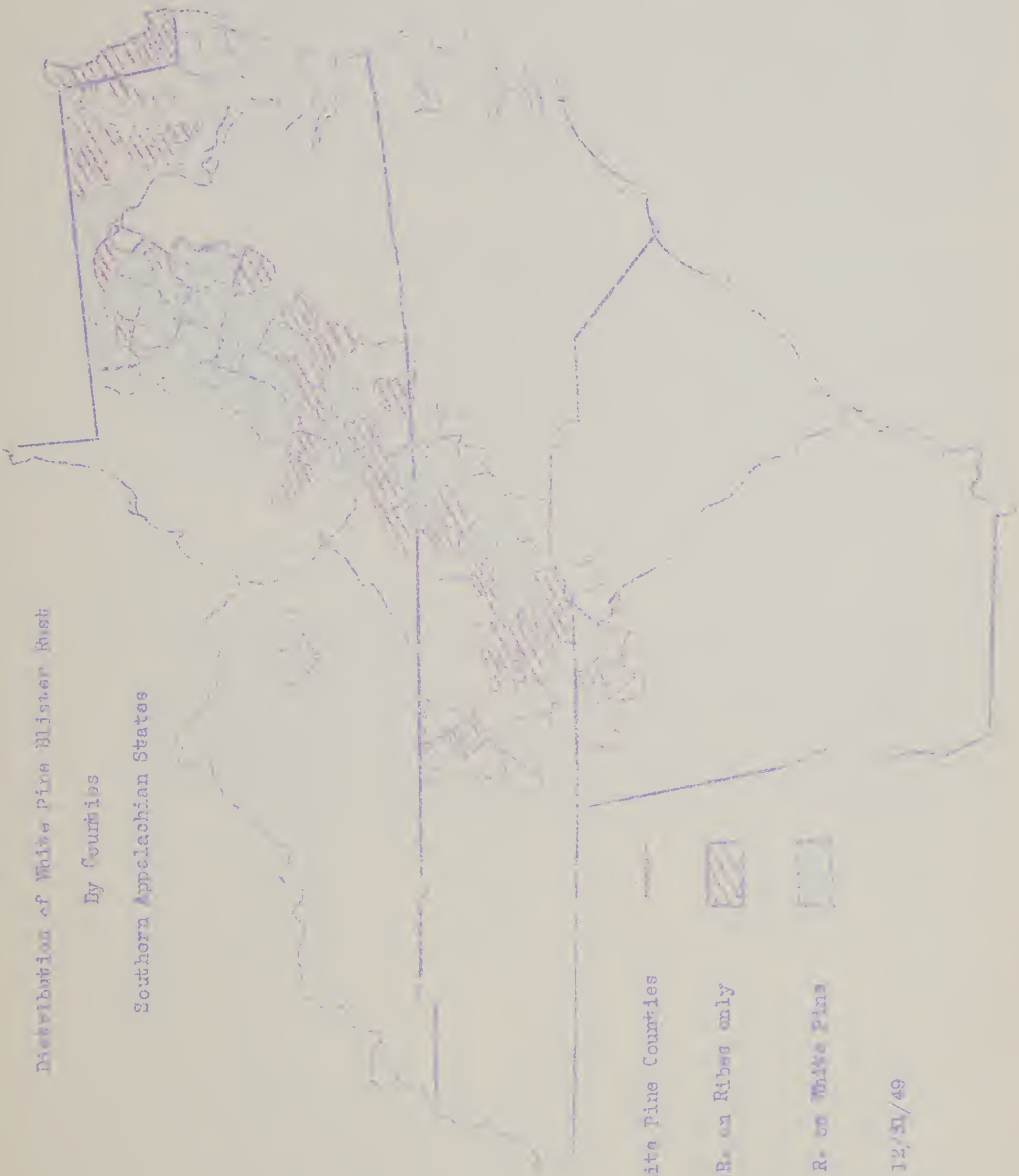
SUMMARY OF RESURVEY WORK IN THE REGION DURING 1949

State	Acres White Pine Surveyed	Acres White Pine Retained In Control Area	Control Area Covered On Survey	Man-Days Expended	Acres Covered Per Man-Day
North Carolina	22,523	22,523	71,280	355	200
Tennessee	318	318	2,500	6*	416
Virginia	38,008	37,668	98,373	1,329	74
West Virginia	3,655	3,505	10,195	58	175
Total	64,504	64,014	182,328	1,748	104
BY OPERATING AGENCIES					
Fed. Service	36,835	36,495	92,869	1,151	81
Park Service	752	752	3,743	105	36
Total Fed.	37,587	37,247	96,612	1,256	77
Cooperative	26,917	26,767	85,716	492	174
Total	64,504	64,014	182,328	1,748	104

* In addition, at least as much time as shown above was spent by supervisory personnel.

Distribution of White Pine Blister Rust

By Counties
Southern Appalachian States



White Pine Counties

B. R. on Ribes only

B. R. on White Pine

1948 Eradication

Eradicating work was carried on in Maryland, North Carolina, Tennessee, Virginia and West Virginia. Provision was made in our plans for considerable work in North Carolina but upon post checking the formerly marked areas in Watauga, Avery and Ashe Counties there was no need for any more eradication work at this time. In many cases the entire area was abandoned. Much of the larger pine had been cut during the war and large areas of white pine reproduction had been killed as a result of suppression by other species. In general, the ribes comeback on all of these areas was very light. Most of the eradication was subsequent work- ing except in Virginia.

Most of the eradication work was continued by three-man crews. However, one additional test was made using the one-man crew. This work covered 180 acres. Ribes were found at the rate of 37.2 bushes per acre and was covered at the rate of 1.13 hours per acre. In the same vicinity 1,156 acres were worked on which ribes were found at the rate of 25.3 per acre. The ground was covered at the rate of 1.44 hours per acre. All of the labor on these two jobs were relatively inexperienced. The checks of this work showed more bushes missed by the one-man than by the three-man crew. This test, together with those conducted in 1948, indicated no marked advantage in using the one-man crew in most of this region. A summary of all eradication work is shown in Table 2 on Page 5.

Checking

Table 2, page 5, shows the result of the checking work during the year. In the future probably more time will be spent in post checking. In many cases data regarding the white pine are taken along with the post checking. As in the case of North Carolina, we sometimes find insufficient pine since the last working to warrant any future expenditures and all or parts of plant areas are discontinued. In other cases, particularly in West Virginia and Virginia, we have found marked increases in density and extent of the white pine which resulted in expanding the areas.

TABLE 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1949

State	Acres Worked			Ribes Destroyed	Man-Days or Eradication	Acres Marked Per M.-D.	Ribes Pulled Per Acre
	Direct (1) Working	Second Working	Other Working				
Maryland	-	557	8,955	51,605	536	8.0	12
North Carolina	-	CONTAMINATED RIBES ONLY	-	2	9	-	-
Tennessee	1,357	40	12	2,094	32	1.8	57
Virginia	89,305	12,368	10,815	352,938	7,730	5.1	8
West Virginia	270	4,994	2,929	155,587	3,517	8.0	16
TOTAL	90,932	17,959	19,691	562,226	9,813	5.6	10
By Operating Agencies							
State & Bureau	13,150	6,585	5,764	264,792	2,802	8.6	14
Forest Service	77,305	11,092	13,096	284,238	6,467	5.3	8
Park Service	477	302	831	13,196	544	2.1	12
TOTAL	90,932	17,959	19,691	562,226	9,813	5.6	10

(1) Includes 14,739 acres first working on which no ribes were found.

(2) Ribes bearing acres only.

TABLE 3

SUMMARY OF CHECKING WORK BY STATES - 1949

State	Ribes Check (1)			Regular Check (2)			Total		
	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days	Strip Acres	Acres Covered	Man-Days
North Carolina	547	11,012	320	-	-	-	547	11,012	320
Tennessee	252	4,369	251	5	98	8	257	4,467	259
Virginia	1,144	23,182	418	1,739	34,770	476	2,883	57,952	896
West Virginia	1,811	37,647	461	199	3,971	62	2,010	41,618	523
TOTAL	3,754	76,230	1,450	1,943	38,839	548	5,697	115,069	1,993

(1) Ribes checks made some years following the last working

(2) Ribes checks made following current year's work.

TABLE 4

STATUS OF BIBBS ERADICATION BY STATES 1932 - 1949

ALL OWNERSHIPS

State	Total Acres		Acres Worked			Ribbs Destroyed	Man-Days	Average On Each Acre	% On Infected Trees	Op-Worked Acres
	White Pine	Non-trail	First Working	Second Working	Other Ribbs					
Delaware	242	6,180	6,186	-	-	6,889	268	6,198	100	-
Georgia	544,476	574,325	270,455	1,009	390	2,995,587	12,860	574,016	92	470
Kentucky	48,175	705,574	746,814	65	65	5,078	1,519	148,314	100	-
Maryland	70,031	144,046	144,046	16,598	28,804	3,954,575	22,560	151,016	98	-
North Carolina	729,893	1,618,351	1,616,640	9,789	4,078	2,810,054	56,945	1,808,716	99	1,891
South Carolina	64,192	150,870	130,870	29,635	-	7,487	2,227	150,270	100	-
Tennessee	771,029	1,642,715	1,629,575	17,530	2,533	6,400,606	49,067	1,676,251	98	8,142
Virginia	701,939	1,886,235	1,817,343	86,255	35,534	11,948,632	130,380	1,693,416	91	43,586
West Virginia	340,599	866,478	949,847	125,798	10,652	7,475,976	70,934	862,522	77	16,131
TOTAL	3,271,185	7,115,300	7,046,470	286,856	79,556	35,604,884	346,540	6,691,705	94	59,870

SUMMARY OF EXPENDITURES FOR FLISTER HUST CONTROL WORK - 1943

BY STATES AND SOURCE OF FUNDS

States	Federal Funds					Cooperative Funds			Total All Funds
	Entomology and Plant Quarantine Adm.	Coop.	Forest Serv.	Park Service	Total Federal Funds	Direct Aid	Indirect Aid	Total Dr. & Ind. Aid	
Maryland	\$ 2,200	\$ 20	-	-	\$ 2,220	\$ 905	\$ 1,000	\$ 1,905	\$ 4,125
North Carolina	2,530	4,911	-	5,613	13,054	3,633	540	4,173	17,427
Tennessee	1,557	1,526	-	1,871	4,954	2,016	180	2,196	7,150
Virginia	32,705	7,144	64,066	11,323	115,238	5,161	980	6,141	121,379
West Virginia	13,902	2,713	10,315	-	26,930	5,773	150	5,923	32,653
TOTAL	\$52,894	\$16,514	\$ 74,381	\$18,807	\$162,596	\$17,688	\$2,650	\$20,338	\$ 182,934

Investigational Work

Tests were conducted during the year using 2,4,5-T for killing wild ribes. Most of these observations can not be completed until the spring of 1950. However, the indications so far are that 2,4,5-T is more effective than 2,4-D. It is questionable whether chemical eradication will ever play an important part in the control work in this region.

Most of the initial eradication has been completed and the bushes which we find on the subsequent workings occur as small patches and scattered individuals. The bushes for the most part are relatively small and shallow rooted and can easily be pulled in less time than is required to spray them. There may appear, however, initial workings in areas of heavy ribes concentrations where chemicals will be suitable. In other cases it may be the best means of destroying abandoned cultivated bushes. This would be particularly true of the yellow flowering currants which sprout readily and are frequently planted along stone walls or foundations where eradication is extremely difficult. R. missouriensis and curvatum are frequently deep rooted and difficult to pull, chemicals may well be used in some instances with these species.

Twenty-two resistant white pine grafts were obtained from Dr. Riker of Wisconsin last spring. These were planted in association with wild ribes in the immediate vicinity of infected white pine. Except where there were native white pine seedlings present some nursery white pine seedlings were also planted with them as checks. These trees were distributed as follows:

10 in the Shenandoah National Park near Old Rag View overlook. This is near the Skyline Drive about 15 miles south of Panorama and about 20 miles north of Swift Run Gap.

4 trees were planted on the George Washington National Forest near the Reddish Knob drive at the Shenandoah Picnic Grounds.

8 trees were planted in a study plot near Creston, North Carolina.

Three of these white pine grafts died during the season but none showed any evidence of blister rust.

Seventeen Canadian Black Currants were obtained through the cooperation of Dr. Hahn, Division of Forest Pathology. These were planted in association with infected white pines and native wild ribes in Ashe County, North Carolina. These bushes were examined several times during the season and no evidence of blister rust was found on any of them while practically all of the wild ribes on the plot were infected by the rust.

International Activities

In 1948 international activities hold an important place in the Southern Appalachian blister rust control program. In blister rust control, like other conservation programs it has been found that those individuals who understand the problem and its potentials are willing cooperators. Field Supervisors report time and time again the change in attitude of groups that have been more or less indifferent, once they have seen the motion pictures and realize that blister rust can kill one of our natural resources -- white pine.

This year "Show-Me" trips were arranged for several groups throughout the region. Several such trips were made to the infection plot in Ashe County, North Carolina and by such trips many cooperators from the southern portion of the region had an opportunity to observe blister rust in the field for the first time. With rust gradually moving south it is worthwhile to have those cooperators engaged in forestry activities acquainted with the disease so they can identify the rust as well as ribes, the alternate host. In West Virginia, a field day at Greenbank was arranged for Vocational Agriculture Instructors from the white pine belt through the State Division of Vocational Education. The Vo-Ag instructors were acquainted with blister rust in the field and general control procedures. Again this year West Virginia University Forestry students enrolled for summer training at Camp Wood, Beola, West Virginia were shown blister rust in the field on the Spice Run area in Greenbrier County.

News items were published at various times throughout the year. Some originated with our personnel but many were released by our cooperators such as State and District Foresters, Extension Foresters and State Entomologists.

Exhibits played a prominent part in the program again this year. Although not used at many more fairs, they were used on several occasions in connection with Conservation Field Days. This year the annual Mountain State Forest Festival at Elkins was held for the first time since the war. The large blister rust exhibit was obtained from the Exhibit Service at Washington and set up in a very desirable location. It was viewed by approximately 70,000 persons in three days.

Near the end of the year a large sign made by the West Virginia Conservation Commission was placed along the road at the edge of a heavily infested, unprotected, white pine area in the Monongahela National Forest. The sign will point out the blister rust infection to passersby and the area will be used as a demonstration in connection with "Show-Me" trips.

The biater radio movies again highlighted the informational activities program. They were shown 254 times during the year to a total of 18,064 persons. The number of showings increased 36.0 percent and the average attendance at each showing increased 35.8 percent over the previous year.

SUMMARY OF INFORMATIONAL ACTIVITIES

	Number	Attendance
News Items Published	12	-
Radio Programs	2	-
Motion Pictures	254	18,064
Meetings & Demonstrations	25	5,320
Exhibits	14	104,800
Publications Distributed	5,150	-

Personnel

Maximum personnel during the year was 283 and consisted of 266 seasonal hourly employees and 22 appointed personnel. At the end of the year only 15 appointed personnel were active. Three were terminated through reduction in force, two were seasonal appointed personnel who were terminated in the fall. Mr. Welch was on furlough practically the entire year due to an extended illness and Mr. Ball left on a years leave of absence on September 23.

1. Regional Office, Harrisonburg, Virginia

* J. Curtis Ball	Regional Leader
John E. George	Asst. Regional Leader
Henry B. Foot	Area Leader, Area I.
	Acting Regional Leader
Ralph W. Welch	Area Leader, Area II
Edward G. Schmidt	Administrative Assistant
Miss Emily M. Lonsger	Clerk-Stenographer
Mrs. Bernice M. Yeakle	Clark
Mrs. Audrey Franklin	Clerk-Stenographer
Mrs. June F. Jarber	Clerk-Typist - Furloughed (MIF) 3/1/49
Miss B. Frances Gardner	Clerk-Stenographer

2. Regional Shop, Bridgewater, Virginia

Miss M. Doyle	Auto Mechanic
	Terminated 4/30/49 (MIF)

* Mr. Ball on leave without pay effective December 8, 1948.
Mr. Foot, Acting In Charge

3. Field - Area I

George C. Cramer	Field Supervisor, Mt. Solon, Va.
Walter A. Stegall, Jr.	Field Supervisor, Asheville, N.C.
Martin Q. Miller	Field Supervisor, Staunton, Va.
Charles A. Redamer	Control Assistant, Harrisonburg, Va.
Henry G. Simmons	Field Supervisor, Monterey, Va.
	Furloughed (RIF) 11/1/49
Miss Joyce L. Cramer	Clerk, Mt. Solon, Virginia
Mrs. Maxine P. Ford	Clerk, Asheville, North Carolina
	(Paid by State of North Carolina)

4. Field - Area II

Glendon E. Keaton	Field Supervisor, Pipestem, W. Va.
Clarence M. Fultz	Field Supervisor, Lost River, W. Va.
Delbert L. Gillispie	Field Supervisor, Arbovale, W. Va.

5. National Park Service

Fields Benton, Checker	Shenandoah National Park, Luray, Va.
Roy Whaley, Checker	Great Smoky Mountains National Park
	Gatlinburg, Tennessee

National Park Service checkers work only part of the year on blister rust control.

Automotive Equipment

The following types of vehicles were on hand in our fleet on December 31, 1949

3	Passenger Cars
4	Sedan Delivery Trucks
4	Half-ton Pickup Trucks
1	Half-ton Canopy-top Trucks
14	Half-ton Panel Trucks
4	One and one-half ton Army Ambulances
1	One and one-half ton Panel
2	One and one-half ton Stakesides
<hr/>	
33	Total

During the year we disposed of two vehicles by sale, one a 1938 Chevrolet Stakebody Truck and one a 1942 Chevrolet Panel Truck. Purchase orders have been issued for one Ford Passenger Car and one Chevrolet Sedan Delivery Truck but these vehicles were not delivered during the calendar year. Two-thirds of our Fleet of vehicles are in the one to three year group and one-third in the eight to eleven year group. Our replacement program provides for the purchase of four to five vehicles each year which will avoid unusually heavy purchases during future years such as happened during 1947.

During the year we terminated the services of one mechanic and one mechanic's helper. Servicing of vehicles is now being accomplished at commercial shops and service stations. Cost comparison for the last six months of 1948 with the same period in 1948 indicates a reduction in our vehicle account expenditures of \$3,671.87. We feel that a worthwhile saving in time also has been accomplished by eliminating the travel time involved in taking vehicles to the shop, a distance of several miles from the regional office and permitting our supervisors to have repairs and servicing performed within a shorter radius from their operating headquarters.

PART II

REPORT OF ELI VICK, SOFT PARTS

ON

STATE AND PRIVATE LANDS

1949

Delaware
Georgia
Kentucky
Maryland
North Carolina
South Carolina
Tennessee
Virginia
West Virginia

PART II

The statistics regarding the work in each State for the current year and also accumulative work through this year are found on pages 23 - 29. Very little information is given regarding the States which were not active during 1949. Details regarding these can be found in previous annual reports and additional information will be supplied directly upon request.

Delaware

No control work was carried on during 1949. Survey and eradication work was carried on in Delaware during 1938 and 1939 and intensive scouting work was carried on during the summer of 1946. Several excellent plantations of white pine are present in the State as well as some native or naturalized stands. Blister rust has been found on several occasions in the counties. None has been reported to date on white pine and no wild ribes have been found. Cultivated ribes have been removed where their presence was threatening native, naturalized, or forest plantations. Many bushes were also destroyed in the vicinity of some of the more extensive ornamental plantations. The future work in this State will consist of periodic scouting to determine the movement of the disease, continued quarantine enforcement to prevent the planting of cultivated ribes near existing white pine and periodic checks on the recently established plantations.

Georgia

No intensive blister rust work was carried on in Georgia during 1949. The status therefore remains the same as shown in last year's annual report. Intensive scouting for blister rust on ribes was carried on for about one week, since the rust had been found last year and again this year nearby in North Carolina. As a result of this, blister rust was reported for the first time in the State. It was found on wild ribes on the Vogel State Park in Union County. These bushes were not near valuable white pine. The fact that the rust is now known to have entered the State will not necessarily alter to any great extent the control program previously outlined. In far as it is known the ribes population has been reduced to a safe point where they occur in association with valuable white pine. Periodic examinations and subsequent eradication work will maintain this safe condition. Scattered stands of individual white pine trees are no doubt present in

association with wild ribes but are so situated that it is not practicable nor economical to protect them. The rust can be expected to become established, at some future time, in such situations. There is no practical way to prevent this and there is no need to do so as long as the ribes are held to a safe level within and near the valuable white pine stands.

The State Department of Parks allotted \$300.00 for work on the Fort Mountain State Park. A small allotment is also available for work on the Chattahoochee National Forest. This is scheduled for the spring of 1950. This will be the first ribes eradication work in the State since 1945. This is probably typical of what a future program will be unless we find white pine naturally invading wild ribes-bearing ground. This can be expected to occur if the spread of white pine noted during the past 15 years continues.

Kentucky

No work was carried on in Kentucky during 1949. Only a few wild ribes have been found on a small area in previous years and it is believed that excellent control has been established. No blister rust has been reported anywhere in the State to date. If possible, intensive scouting should be carried on during late August and early September. The rust distribution in Indiana, Ohio, West Virginia, and Tennessee indicate definitely that ribes bushes almost anywhere in Kentucky could become infected by airborne ascospores, especially during a favorable year. Many white pine plantations have been established throughout the State and some excellent native white pine is found in the Cumberland Mountains, particularly in the Red River vicinity. While rust could become established there is little likelihood of any appreciable damage occurring. The State's future work should consist of periodic scouting for the disease and checking on the spread of native white pine or the establishment of new plantations.

Maryland

During the year 51,605 wild ribes were destroyed on 4,292 control acres with an expenditure of 535 man-days. The work was confined to land owned by the State Department of Forests and Parks on adjacent or intermingled private holdings. It was financed by funds provided by that State Department and the Bureau. The eradication work was performed on the lower part of Sideling Hill Creek drainage in Washington and Allegany Counties, and Town Creek drainage in Allegany County. Several areas were also worked on the Potomac and Swallow Falls State Forest in Garrett County.

Further details regarding the work are reported in the statistical section on Pages 23 - 29. The status table on Page 27 shows 70,884 acres of white pine in all ownerships in the State. This is a reduction of about 2,500 acres as compared to last year with a corresponding reduction in control acres and other items. This was brought about due to discontinuing control on several privately owned areas, mostly in Garrett County. Practically no work has been done on these areas since 1939 - 1940. A severe reduction in white pine was found due to cutting, suppressing of white pine reproduction by hardwoods, fire, and loss from the blister rust. In some cases a heavy comeback of ribes was found during the 10-year period.

Most of the work of re-examining these pine areas was performed by Mr. J. E. Paulhamus, Farm Forester in this county.

During the last two years re-working was completed in eastern Allegheny and western Washington Counties where no work will likely be required for eight to ten years. The white pine owned by the Department of Forests and Parks in Garrett County is being protected, re-examined, and re-worked approximately on schedule. Considerable work remains to be done on the private holdings in this county. No work has been performed in eastern Washington or western Frederick counties since 1941. A re-examination of this area should be made to determine the pine, ribes, and rust situations.

North Carolina

The only work carried on in North Carolina during the year was re-survey and post checking. Over 11,000 acres, mostly in Ashe, Watauga, and Avery Counties, were checked during the year. These areas were, for the most part, worked for the last time about 1942 and 1943. There was no immediate need found in any case for ribes eradication work. Many of the areas were discontinued because of a reduction in pine due to lumbering or suppression of reproduction by hardwoods. Survey work was carried on in Madison County where over 71,000 acres were surveyed, on which were found over 22,500 acres of white pine. About half of the county is completed and the indications so far are that there will be a large increase in the white pine acreage over the 1938 estimate. Pine is found at considerably higher elevations and in some cases near wild ribes. Blister rust was found for the first time on ribes in Macon and Jackson Counties. It was also found in most of the other counties farther north than which it had been previously reported. The rust was reported for the first time on pine in Yancey, Buncombe, and Haywood Counties. The infection in Haywood County was in the Great Smoky Mountains National Park. It consisted of a single canker on one tree. The infection in Buncombe and Yancey Counties was in the vicinity of Mt. Mitchell. The Buncombe

Many infection was on native scattered white pine and that in Vancey was on the western white pine (*P. m. monticola*) which was a part of an experimental plantation established several years ago in the vicinity of Mt. Mitchell. The widespread ribes infections for two consecutive years indicate definitely that there are many infections on white pine which have not been found. It appears that the wave of rust swept over most of the western counties about 1941. This seems to have resulted in several small infections which are now developing locally and providing a secondary spread. Practically all of the white pine infections in scattered stands are individual trees growing in association with fairly heavy concentrations of ribes. These white pines are above the optimum elevations range of white pine in the State. It is not economically feasible or practicable to protect such scattered white pine. The rust can be expected to develop in such cases where ever pine and ribes are in association. This does not mean any commercial loss from the blister rust. The pine which is worth protecting has, for the most part, received such protection through the eradication of wild ribes nearby during the past several years.

For all practical purposes control has been established throughout the State. The future problem is periodic re-checking and re-eradication when and where necessary. Some additional survey will be necessary in order to keep up with the natural spread of white pine and also plantations. Information is being assembled regarding the distribution of wild ribes throughout the mountainous country. This is being made available to State and Federal officials who will likely plant or influence the planting of white pine. Every effort is being made to avoid the planting of white pine in areas where wild ribes are numerous.

South Carolina

No work has been carried on in South Carolina since 1947. The status, therefore, remains the same as shown in last year's annual report. The survey is fairly complete on the Bunker National Forest and shows a little over 10,000 acres of white pine. Our records indicate over 45,000 acres of white pine in privately owned lands in the State. No wild ribes have been reported anywhere in the State to date. They could, however, be present since one concentration of these bushes was found in North Carolina along the White Water River a few miles north of the State line. The future work in South Carolina should consist of periodic scouting for the rust on cultivated bushes and if also permits some scouting for wild ribes. Consideration should be given to establishing quarantine control areas. This would in effect prohibit the importation of cultivated ribes into the white pine growing sections of the State. The blister rust has become established far enough south in North Carolina and probably Tennessee so that infection could occur on ribes bushes almost anywhere in the northwestern part

of the State especially during a favorable year. The detailed statistics regarding the white pine in the State are found on pages 23 - 24.

Tennessee

A relatively small control program was carried on during the summer months of 1949. Work consisted of survey in Blount County and eradication and checking work in Morgan and Cumberland Counties. In addition to this, some work was conducted on the Tennessee side of the Great Smoky Mountains National Park. The details of this work are shown in the tables on pages 25 - 29.

Blister rust was reported on ribes for the first time in Union County. It was again found on ribes in some of the other counties from which it had been previously reported. Intensive scouting in western North Carolina indicated a spread of the rust in this section of the country somewhat similar to that of 1948. Rust was reported for the first time in two of the southwestern counties of North Carolina and also for the first time in Georgia. No additional rust was found during the year in the Cumberland Mountains area but this should not be taken to indicate that none was present. The rust has been found on pine for the first time in Lenoir, Haywood and Swain Counties North Carolina. Two of these border on the Tennessee line. In each case this rust infection was at high elevations in low valued pines. There is no likelihood of any commercial damage from the rust to the white pine in Tennessee if a reasonable amount of scouting, checking and ribes eradication work is conducted. Most of the white pine is growing in areas where no wild ribes are found. Where wild bushes are found in association with good white pine there has been suppression through one or more eradication workings and a high degree of control has been established.

During 1950 we plan on considerable checking and eradication working if found necessary in the Cherokee National Forest and other private holdings along the western mountain range. We also plan on ribes eradication work on the white pine plantations on the Blount State Forest. Several grids not completed during the 1948 season in Johnson County are also scheduled for examination in 1950.

Virginia

In 1949 control work was carried on in somewhat the same manner as during the previous years. Surveys, eradication and checking work was conducted on State and Private lands in northern counties as well as the Shenandoah National Park and the George Washington National Forest. An informal examination was made of many of the previously worked ribes areas on the Jefferson National Forest and nearby private

holdings. No need was found for formal checking work for a few more years. Most of the survey work was confined to Bath, Alleghany and Rockbridge Counties. Eradication work was conducted in Shenandoah, Spackman, Giles, Bath, Highland, Alleghany and Rockbridge Counties in addition to the Shenandoah National Park. Details of this work are shown in the tables on pages 23 - 29.

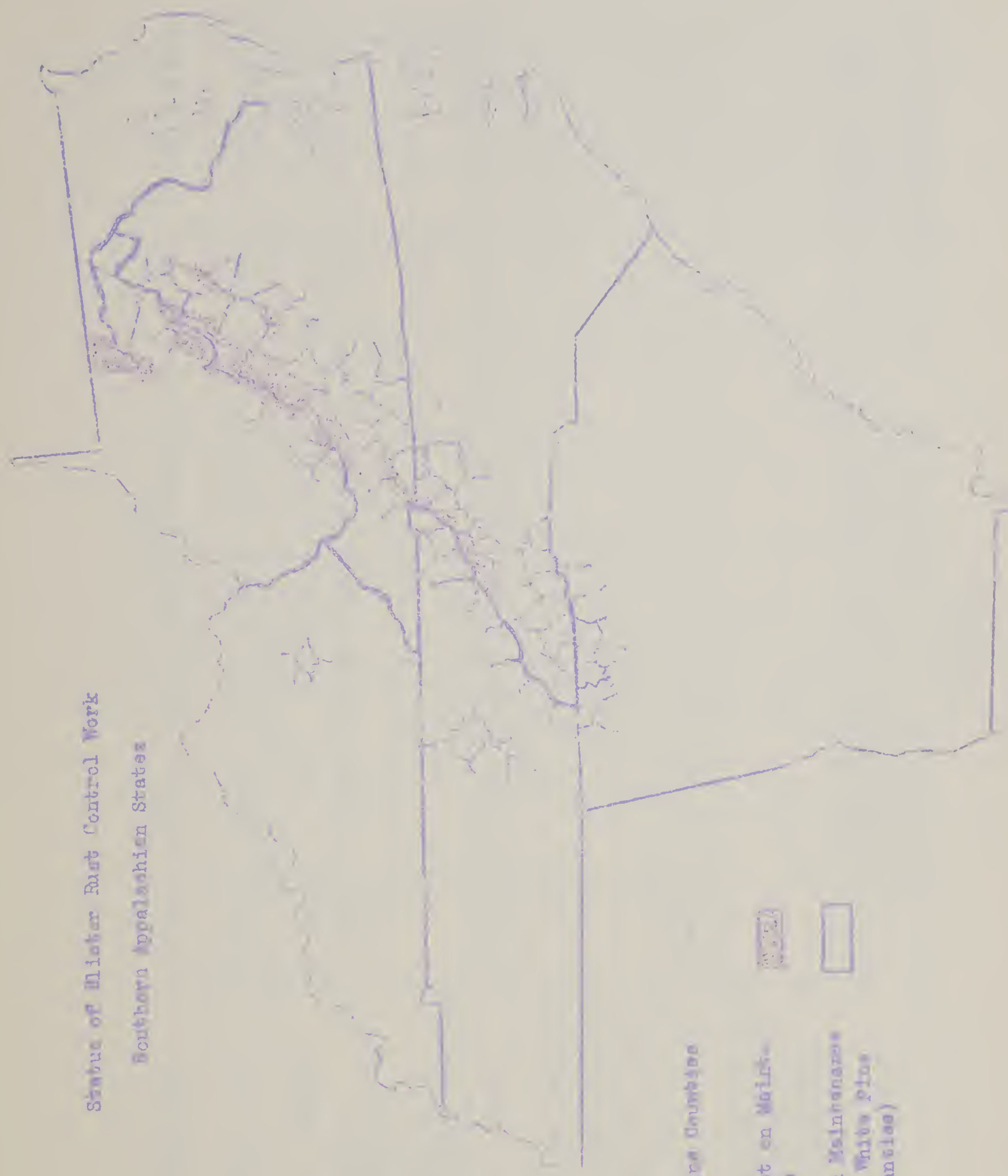
The blister rust distribution remains about the same as 1948. We appear to have established a good measure of control generally in that part of the State south and west of Roanoke. Here the infection on pine appears to be fairly well confined to small isolated areas. Generally speaking, north of Roanoke there is a more widespread distribution but the progress of the disease has been definitely held in check.

During 1950 we will concentrate on survey work on private and federal holdings in Rockbridge, Amherst, Nelson and Augusta Counties. A large amount of eradication work remains to be done on private holdings particularly in Bath County. We are fairly well caught up on this work in the other counties surrounding the George Washington National Forest. It is hoped that we can complete the survey and do the necessary eradication work in the northern counties within the next few years, since by that time it probably will be necessary to re-open the work in the southwestern counties where we expect some ribes comeback and the need for eradication work. If that schedule can be maintained this will enable us to concentrate on the southwestern counties for one or two years out of each eight or ten. During this time we will have a minimum of work going on the northern counties and after completing the southern counties we will then concentrate on the northern areas.

West Virginia

During the year over 155,000 ribes were pulled on slightly less than 10,000 acres. Most of this was work carried on on a cooperative basis on State and Private lands. All of the work that was found necessary was conducted on the Monongahela and George Washington National Forests but the work on private lands is falling far behind the schedule necessary to maintain adequate control. This was particularly true during the last half of the calendar year because of the reduction in funds for the fiscal year beginning July 1. The work on private lands was conducted in Hardy, Mercer, Pendleton and Pocahontas Counties. A small amount of checking work was conducted in Greenbrier County. A large amount of work remains to be done in these counties as well as in other white pine counties, especially Summers, Raleigh and Monroe.

Status of White Rust Control Work
Southern Appalachian States



White Pine Counties

Areas Not on White
Rust Control Work

Areas on White Rust Control Work
(Within White Pine
Counties)

TABLE 6

SUMMARY OF RIBES ERADICATION WORK - 1949
BY PROJECTS

PROJECTS	FIRST WORKING			SECOND WORKING			OTHER WORKING		
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
FEDERAL PROJECTS:									
Geo. Wash. N. For.	77,305	98,541	1,968	11,092	111,966	2,216	11,456	67,102	2,136
Monongahela N. For.	-	-	-	-	-	-	1,640	6,623	147
Sub-Tot. For. Serv.	77,305	98,541	1,968	11,092	111,966	2,216	13,096	73,725	2,283
Shenandoah N. Park	477	450	20	302	1,369	148	831	11,373	366
Gr. Smoky M. N. Park	-	-	-	-	-	-	-	4	10
Sub-Tot. Park Serv.	477	450	20	302	1,369	148	831	11,377	376
TOTAL - FEDERAL	77,782	99,091	1,988	11,394	113,335	2,364	13,927	85,108	2,659
COOPERATIVE PROJECTS:									
Maryland	-	-	-	357	3,627	77	3,935	47,978	459
Tennessee	1,357	261	3	40	1,452	20	12	379	8
Virginia	11,523	42,304	945	1,174	23,581	179	1,220	7,853	174
West Virginia	270	129	4	4,994	133,080	227	597	4,166	107
Sub-Tot. Coop.	13,150	42,694	952	6,565	161,740	1,103	5,764	60,358	747
GRAND TOTAL	90,932	141,685	2,940	17,959	275,075	3,467	19,691	145,466	3,406

TABLE 8, CONTINUED

SUMMARY OF HIRES READICATION WORK - 1949

BY PROJECTS

PROJECTS	ALL WORKINGS		PER ACR		Total Seasonal Employees
	Adms	Billed Incurred	Man-Days	Man-Days	
FEDERAL PROJECTS					
Geo. Wash. Nat. For.	93,953	277,003	6,300	17	151
Monongahela Nat. For.	1,640	6,629	147	63	9
Sub-Tot. Fed. Serv.	101,495	284,528	6,447	139	159
Shenandoah Nat. Park	1,210	16,192	551	17	19
Or-Smoky Mt. Nat. Park	-	4	10	-	8
Sub-Tot. Park Serv.	1,610	12,196	561	17	27
TOTAL - FEDERAL	103,105	297,434	7,001	-	159
COOPERATIVE PROJECTS:					
Maryland	4,292	51,605	535	12	15
Tennessee	1,409	2,092	31	53	14
Virginia	18,917	72,718	1,298	15	47
West Virginia	5,851	137,377	936	27	21
Sub-Tot. Coop	28,469	264,792	2,800	107	107
GRAND TOTAL	131,574	562,226	9,801	116	236

TABLE 7

SUMMARY OF ACRES WORKED ON RICE BRADICATION - 1949

BY OWNERSHIP

	A C R E S				Total All Workings
	First Working	Second Working	Other Working		
FEDERAL LANDS:					
George Washington Nat. Forest	29,914	8,911	9,302		48,127
Monongahela National Forest	-	-	431		431
Sub-Total Federal Lands	29,914	8,911	9,733		48,548
Shenandoah National Park	477	302	831		1,610
Great Smoky Mountains Nat. Park	-	-	-		-
Sub-Total Park Service	477	302	831		1,610
TOTAL - FEDERAL	30,391	9,213	10,564		50,158
STATE AND PRIVATE LANDS:					
Maryland	-	357	3,935		4,292
Tennessee	1,357	40	12		1,409
Virginia	58,914	3,355	2,636		64,905
West Virginia	270	4,994	2,654		7,918
TOTAL - COOPERATIVE	60,541	8,746	9,237		78,524
GRAND TOTAL	90,932	17,959	19,801		128,692

TABLE 6

STATUS OF CHIEF'S FIRST CONTROL WORK AS OF 11/30/49
OF OWNERSHIP

Ownership	TOTAL ACREAGE		1st Wkg.		2nd Wkg.		Oth Wkg.		Un-Worked Acres		On Maintenance	
	White Pine	Coconino	Acres	Acres	Acres	Acres	Acres	Acres	Acres	Per-cent	Acres	Per-cent
FEDERAL LANDS:												
Gao. Wash. Nat. For.	165,000	107,100	367,338	57,548		24,351		9,844	295,523	78		
Jefferson Nat. For.	24,462	127,100	107,474	3,737		856			102,869	96		
Monongahela Nat. For.	40,000	100,000	89,569	11,606		121		570	80,628	90		
Cumberland Nat. For.	10,530	10,000	32,002	65		65			32,002	100		
Pisgah Nat. For.	79,524	151,170	154,780	2,918		1,555		10	149,965	97		
Nantahala Nat. For.	43,013	24,151	62,716					436	62,716	99		
Cherokee Nat. For.	250,000	200,000	484,572	2,103		1			481,266	100		
Sumter Nat. For.	18,000	80,000	53,862	3,700					53,862	100		
Chattahoochee Nat. For.	235,000	200,000	349,903	330					349,713	99		
Sub-Total Forests	970,000	1,000,000	1,702,206	82,006		26,949		10,659	1,608,537	94		
Shenandoah Nat. Park	3,869	11,010	16,935	6,764		4,669		675	9,759	55		
Blue Ridge Parkway	5,331	11,501	12,581	856					11,545	92		
Great Smoky Mts. N.P.	65,167	207,100	107,722	413		380			107,233	99		
Sub-Total Parks	70,037	227,100	137,238	8,033		5,029		675	126,540	93		
Cherokee Ind. Res.	92	445	445						445	100		
Sub-Total Interior	70,249	227,100	137,683	8,033		5,029		675	126,985	93		
TOTAL ALL FEDERAL	1,050,949	1,391,200	1,839,889	90,038		31,978		11,334	1,737,522	94		

TABLE 8 CONTINUED

(See Across)

Ownership	Total Acres		1st Reg.	2nd Reg.		Other Reg.	Un- Revised Acres	On Maintenance	
	Miles plus	Grassland Net & Profit.		Acres	Acres			Acres	Per- Cent
STATE & PRIVATE LANDS									
Delaware	232	5,195	6,132				5,185	100	
D. C. Reg.	840, 800	324, 086	314, 452	875	300		324, 308	99	
Kentucky	31, 138	114, 712	176, 515				114, 512	100	
Maryland	70, 884	164, 845	164, 845	15, 498	27, 314		153, 810	93	
North Carolina	592, 886	1, 366, 725	1, 364, 474	8, 468	2, 163		1, 362, 958	99	
South Carolina	45, 328	77, 008	77, 008	95, 936			77, 008	100	
Tennessee	684, 852	1, 074, 847	1, 071, 504	15, 531	2, 632		1, 051, 488	98	
Virginia	808, 824	1, 419, 563	1, 376, 155	29, 317	9, 817		1, 330, 187	94	
West Virginia	382, 968	717, 374	707, 045	105, 307	9, 579		585, 677	75	
Sub-Total Cooperative	2, 220, 358	5, 364, 077	5, 205, 531	165, 818	67, 578		4, 958, 766	94	
Sub-Total Federal	1, 050, 349	1, 851, 223	1, 839, 669	60, 076	11, 970		1, 737, 623	94	
GRAND TOTAL	3, 270, 707	7, 215, 300	7, 045, 190	225, 894	79, 548		6, 696, 389	94	

TABLE 2

SUMMARY OF RIBES ERADICATION WORK - 1912-1918

BY PROJECTS

PROJECT	FIRST WORKING			SUBSEQUENT WORKINGS			ALL WORKINGS		
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
FEDERAL:									
Geo. Wash. Nat. Park	452,698	1,253,597	14,944	69,921	1,521,202	27,727	532,619	2,015,139	75,681
Jefferson Nat. Park	302,262	128,543	337	3,156	199,368	1,494	305,418	327,901	1,831
Monongahela Nat. Park	29,090	225,331	2,240	15,520	93,975	3,147	44,610	319,306	5,387
Cumberland Nat. Park	38,730	13	228	65	36	8	38,795	49	333
Pisgah Nat. Park	50,937	52,087	1,014	3,007	11,509	507	53,944	63,596	1,321
Nantahala Nat. Park	20,434	-	45	-	-	-	20,434	-	45
Cherokee Nat. Park	541,293	1,966,590	11,138	24,548	30,417	561	565,841	1,997,007	11,799
Sumter Nat. Park	48,561	-	382	-	-	-	48,561	-	382
Chattahoochee Nat. Park	233,116	1	2,523	294	11,490	408	233,410	11,491	2,931
Sub-Total Nat. Forests	1,731,221	3,826,032	32,951	116,581	1,908,227	23,732	1,847,802	3,844,289	59,713
Shenandoah Nat. Park	18,602	1,254,387	11,861	15,610	615,041	9,490	34,212	1,869,428	21,351
Blue Ridge Parkway	10,841	18,243	467	856	3,637	122	11,697	21,900	659
Great Smoky Mts. Nat. Park	28,285	95,254	1,421	3,378	6,796	312	31,663	100,560	1,733
Sub-Total Nat. Parks	57,528	1,367,904	13,749	19,844	623,984	9,994	77,372	1,991,888	23,743
TOTAL ALL FEDERAL	1,788,749	4,993,966	46,700	136,425	2,532,211	36,756	1,925,174	7,536,177	83,456

TABLE 9. CONTINUED

(See Above)

FIRM	FIRST WORKING			SUBSEQUENT WORKING			ALL WORKING		
	Jobs	Other Destroyed	Jobs Destroyed	Jobs	Other Destroyed	Jobs Destroyed	Jobs	Other Destroyed	Jobs Destroyed
COOPERATIVE	8,134	6,089	309	-	-	-	-	8,883	688
Delaware	414,111	2,739,079	8,679	2,812	147,618	1,012	1,301,056	9,919	9,919
Georgia	182,160	4,056	1,164	60	309	19	164,079	5,029	1,182
Kentucky	776,328	2,179,704	12,312	85,110	775,161	7,628	541,900	6,954,670	25,566
Maryland	1,000,883	2,990,642	42,295	143,959	382,866	11,247	1,774,321	7,868,611	64,260
North Carolina	81,508	7,437	1,045	-	-	-	1,774,321	5,029	1,846
South Carolina	1,160,013	5,955,328	30,577	61,450	385,690	6,206	1,011,400	4,408,029	85,556
Tennessee	1,075,100	5,099,733	58,680	51,119	1,449,688	18,369	1,126,183	7,645,887	78,247
Virginia	809,679	5,660,646	62,090	128,590	967,611	15,773	957,917	6,202,509	68,077
Sub-Total Corps	8,134,883	25,803,075	198,179	472,847	4,275,368	84,068	6,967,071	20,096,707	232,094
Sub-Total Federal	1,799,740	4,973,998	38,700	135,450	2,632,371	36,708	1,916,174	7,338,179	80,456
GRAND TOTAL	7,275,360	28,797,043	246,179	608,297	6,907,739	102,776	7,883,245	27,434,886	312,550

PART III

VICTORY OF BLIGHTS 1972 CONTROL

ON

NATIONAL FORESTS

1945

REGION 1

Cherokee
George Washington
Jefferson
Monongahela

REGION 2

Chattahoochee
Cherokee
Santahale
Pisgah
Smoky

PART III

NATIONAL FORESTS

Statistics regarding the National Forests are found on pages 22-29. In order to avoid repetition, very little is stated in the cases of those forests which are and have been inactive for some time.

REGION 7

Cumberland National Forest

No work was performed during 1949 and the status remains the same as shown in the annual report for the year 1947. Due to the spread of the blister rust during the last two years in Tennessee and North Carolina, we believe it desirable that some scouting be done within the purchase area of this forest for the rust on wild and cultivated ribes during August and September 1950.

George Washington National Forest

During the year slightly under 100,000 acres of control area were worked, of which over 67,000 were ribes-free. There were over 277,000 ribes pulled on the 32,000 acres of crew work. About 10,000 acres of this was initial work. Resurvey was conducted on over 92,000 acres. This, for the most part, was in the Warm Springs and James Ranger Districts. Considerable progress was made in bringing the eradication work up with the survey. At the end of last year there were some 22,000 acres surveyed but not worked. At the close of this year there were about 4,500 acres unworked on the records. At present the survey is practically completed on all the ranger districts except the Padlar. The white pine acreage was nearly 135,000 with a control area of about 320,000. Of this, about 120,000 is regarded as ribes-area. The re-survey will be completed on the James Ranger District sometime in January of 1950, and work will be started on the Padlar District. It is difficult to estimate when this will be finished due to the large increase of white pine and the acreage found necessary to cover on survey. Rich County is a good example of the inaccuracy of the area estimates. In 1945 when the survey was getting underway in this county, we estimated approximately 10,000 acres of white pine. When the survey was finished during 1949 we had over 25,000 acres regarded as worth protecting. The statistics of control by ranger districts is much the same as that shown in the 1948 annual report except that re-survey is nearly finished on the James District.

Much thought was given to the problem of determining what white pine was not worth protecting. There was a large acreage on the forest which white pine is fairly low density and consists essentially of a scattering of seed trees with an understory of reproduction. This reproduction is frequently severely suppressed. Arrangements were made for a field trip and a conference with Forest Service officials on this subject early in 1950. It is hoped that during 1950 we will complete a large portion of the re-survey on the Padlar Ranger District and as nearly as possible catch up with the initial eradication. The progress of this work has been considerably slower than we anticipated five years ago. This is the result of finding much more white pine than was expected and also the increase in wage rates made fewer man-days available with a given amount of money.

While blister rust is present throughout most of the areas of the forest where we have pine and ribes in association, the actual loss from the rust has been very light. A very good degree of control has been established and in many cases the ribes-comeback following initial and second working has been very light. The present outlook for white pine on the forest is good providing we can continue to hold down the ribes population and release much of the white pine reproduction through T.S.I. work scheduled as such or through timber sales. Good progress is being made in this direction, but much remains to be done. The future is somewhat uncertain at present in the drainage areas of North River and Little River on the Dry River Ranger District. As a result of a severe flood during June of 1949 we now have many landslides at the higher elevations and large deposits of silt, duff and debris over some of the valleys. We can expect a certain amount of ribes regeneration from seed being carried down as well as parts of bushes which may take root and grow. Just what will happen in this respect can not be determined for about two years.

Jefferson National Forest

The only work carried on in the Jefferson was an informal examination of the ribes-bearing control areas. No immediate need was found for any eradication work or post checking. Another examination should be made of these areas if time permits during 1950 and 1951, preferably during late April or early May. It is almost certain that some work will be necessary in a few more years. A resume of the situation on the Jefferson is found on pages 44 - 46 of the 1948 annual report.

Monongahela National Forest

During the year over 12,500 acres were worked and over 8,600 wild ribes were destroyed. All of this was on control area which had been worked at least two times previously. There is no marked change in the status of control on the forest since last year. Our present plans are to continue pest checking several areas and do some eradication work during 1950. A good measure of control has been established and only a small amount of work will be necessary each year unless there is a marked extension of white pine or additional land purchases increasing the need for work.

REGION B

Very little blister rust control work was found necessary in the region during the last year. Some re-survey work was conducted on a part of the Pisgah National Forest lying in Madison County, North Carolina by the cooperative project in the course of their survey on adjoining privately owned lands. Extensive scouting for blister rust was carried on in the purchase area of the Pisgah, Wantehala, parts of the Cherokee and Chattahoochee National Forests. The extent of the rust on bushes appeared to be very similar to that of 1948 except that it was more widespread. The rust was found for the first time in the purchase area of the Chattahoochee. This was on ribes in the Vogel State Park in Union County. Rust was also reported for the first time in Macon and Jackson County, North Carolina as well as Unicoi County, Tennessee. It was found for the first time on white pine in Yancey and Buncombe Counties in the Pisgah areas and also in Haywood County in the Great Smoky Mountains National Park. All of these infections were found at high elevations and relatively low valued white pine. The Yancey County infection was on P. maritima plantations in the vicinity of Mt. Mitchell. This spread of the rust can be expected to continue in the low valued, scattered white pine areas where it is found in association with wild ribes. There is no practical or economical way of preventing this. Ribes populations have been reduced to a safe point where they are in association with the more valuable white pine and as long as this condition is maintained, pine will be protected regardless of what happens elsewhere. A few areas of relatively low value white pine were found in association with wild ribes during the re-survey of the Wantehala National Forest. These were not protected at that time since no rust was known to be in that vicinity. These should be examined in cooperation with Forest Service representatives and scheduled for work as soon as practicable or dropped from the records.

The future problems on each of these forests remains much the same; briefly they will be somewhat as follows:

1. Periodic general examinations of the ribes-bearing control areas.
2. General post checking when the ribes comeback appears to make it necessary.
3. Ribes eradication work where found necessary as a result of the post checking.
4. Periodic scouting to determine the spread of white pine or its increase in density in ribes-bearing areas. When and if the pine values are found sufficient to justify the work, the control areas should be extended.
5. Checking white pine planting sites to avoid establishing them in heavy wild ribes areas.

In all probability, small amounts of work will be necessary each year on one or more of the forests. The main problem is in the Pisgah. Some work will be necessary from time to time on the Cherokee, and Nantahala. Occasional work will be needed on the Chattahoochee and the present indications are little, if any, on the Sumter.

PART IV

REPORT OF ELSTER BOST COMPANY.

OF

NATIONAL FAIRS

1940

Blue Ridge Parkway
Great Smoky Mountains
Shenandoah

PART IV

BLUE RIDGE PARKWAY

Status of Control

The status of control on the Blue Ridge Parkway remains about the same as last year; namely, all on maintenance. Survey work in North Carolina, however, did increase the acreage of white pine and control. All of this increase was in ribes-free areas. As it now stands there are 5,391 acres of white pine in the 12,561 acres of control. This does not include the white pine or control acreage between Adney Gap and the North Carolina-Virginia line. Most of this area is free of wild ribes and to date we have not computed the acreage.

Work During 1949

The only work carried on during 1949 was a general examination of the control areas by representatives of the Park Service or the Bureau. A general examination was made of the Cone Estate near Blowing Rock, North Carolina. An examination was made of the Section 2-Q which includes about eight miles of Parkway right-of-way north of Oteen, North Carolina. Some white pine was found and no sites particularly favorable to wild ribes were noted. There are a number of homes in this vicinity which will need to be checked at some future date for cultivated ribes. In many cases it is difficult to appraise the aesthetic value of white pine trees along the Parkway before the grading is completed. This being one of those cases, it was decided to postpone any ribes survey or eradication until after that time.

Work Scheduled for 1950

1. A detailed survey of the Cone Estate and other Parkway property in the immediate vicinity.
2. Ribes eradication work in this same area if found necessary.
3. A re-examination of the control area in the sections between Tye River Gap and the James River. A resurvey along this part of the Parkway is scheduled to be carried on by the Bureau during 1950. This will be performed incidental to that work.
4. Continue scouting for blister rust, particularly south of Adney Gap.

Status of the Rust

Blister rust was again found on ribes in the vicinity of Craggy Mountain. This was a part of a general spread in western North Carolina and eastern Tennessee which was somewhat similar to that of 1948. A possible source of this rust was found in early December 1949 by District Supervisor Stegall of the Bureau. Several trees in an experimental plantation of *P. monticola* were found infected. This plantation was on the eastern slope of Mt. Mitchell about one mile from the Parkway property. It apparently originated about 1941. This infection is believed to be just another one of several which originated in western North Carolina about that time. Another infection on white pine was also found along the Parkway in Buncombe County, North Carolina. It was on scattered native white pine near Craggy Pinnacles.

SHENANDOAH NATIONAL PARK

Status of Control

There is now about 47% of the control acreage in the Park on maintenance, the increase being from 6,704 acres to 8,317 acres. This total includes only whole white pine areas placed on maintenance. In addition, portions of other areas on a maintenance status if added would bring this total of acres on maintenance to 9,759.

The reduction in ribes per acre year after year is continuing to a marked extent. The effectiveness of control work was particularly noted at the Elkwallow developed area. Since the beginning of eradication in this area, over 75,000 ribes have been pulled. This year it was found necessary to work 195 acres on which ribes were found at the rate of about 7 per acre. At the time of the first working almost 35 ribes per acre were found. Several old trunk bankers can be found on white pine trees but practically no new infection is present. In contrast with this, many dead and dying white pine can be found in the unprotected and abandoned areas. Examples of this are near Hawksbill, Lewis Mountain and Hughes River Gap.

Status of Control 1949

White pine in control area	3,669 acres
Control acreage in Park	17,610 acres
Control areas initially worked	16,935 acres
Control areas reworked	11,435 acres
Total ribes destroyed	2,682,041
Total man-days used	64,001
Percent of initial work completed	98%
Acreage on maintenance	8,317

These figures include work expended on Park land and adjacent Private land.

Work during 1949

During this past year ribes eradication work was conducted on the following eight areas:

Pinnacles Area #2	Spindler #8
Pase Mountain #14	Elkwallow Gap #7
President's Camp #28	Catlett Mountain #37
Hazel Mountain #42	Poseen Hollow #38

<u>Ribes Bearing</u> <u>Initial</u>	<u>Acreage</u> <u>Re-worked</u>	<u>Worked</u> <u>Total</u>	<u>Man-Days</u> <u>Used</u>
482	1,187	2,608	534

In addition, as a result of post checking, a change in the status was effected on Moorman River #32, Big Run #41 and Gap Run #49:

This is an increase over last year in acreage with a decrease in ribes, man-days and ribes per acre.

A total of \$11,323.00 was expended during the calendar year, which includes excess funds transferred from the Blue Ridge Parkway.

Resurvey work was conducted on 3,743 acres which included the following areas:

Skyland #3	Fork Mountain #56
Big Meadows #4	Dean Mountain #57
Hawksbill Creek #22	Naked Creek #58
President's Camp #26	Powell Mountain #59
Pignut Mountain #40	Elkwallow project

Post checking work was conducted on 6,422 acres and included the following areas:

Skyland #3	Pignut Mountain #40
Big Meadows #4	Hazel Mountain #42
Spittler Pine #8	Conroy River #3
Big Run #41	Poseen Hollow #38
Pase Mountain #14	Fork Mountain #56
Elkwallow Gap #7	Dean Mountain #57
President's Camp #28	Naked Creek #58
Moorman's River #32	Powell Mountain #59

Advance checking was also conducted on 320 acres which included:

Catlett Mountain #37	Gap Run #49
----------------------	-------------

Work Scheduled for 1950

As a result of the post checking during 1949 we have the following areas scheduled for re-eradication next spring:

<u>Area</u>	<u>Acres to Work*</u>		
Skyland #3	33	to	68
Big Meadows #4	708	to	995
Pignut Mountain #40	9	to	36
Fork Mountain #56	50	to	70
Dean Mountain #57	115	to	245
	915	to	1412

In addition to the above we plan to post check and if possible do the necessary eradication work on the following areas:

- Potter Mountain #42 - 150 acres not checked on last Post Check and working.
- Elkwallow Ranger Station #52 - If check of white pine for cankers warrants retaining area.
- Turks Branch #35 - Scout, a recheck on late fall P.C.
- Conway River #43 - Scout, recheck on late fall P.C.
- Ivy Creek #30 - 115 acres

The following areas are scheduled for post checking during the late summer of 1950 and will be worked to the extent found necessary during the spring of 1951:

Lewis Mountain #6	325 acres
Hawksbill #1	870 acres
Neighbor Mountain #22	130 acres
Dickey Hill #23	405 acres
Rocky Bar #13	320 acres
Gravel Spring Gap #55	122 acres
	<u>2,172 acres</u>

Routine check of the following areas which may not be ribes-bearing:

Madison Run #9	Park Headquarters #44
Oventop Mountain #16	Gravel Ridge #45
Beech Spring Hollow #21	Jewell Hollow #46
Bazel Road #36	Front Royal #51
Joremys Run #38	Pond Branch Ridge #34

* Eradication crews sometimes find it necessary to work more or less area than is estimated by the checker. The actual acreage worked will probably be within the estimated range shown. (H.Y.)

The following areas remain to be resurveyed.

Hawksbill #1
Ivy Crank #50 (also mapping)
Elkwallow project

And other white pine areas in which the early records and maps are now becoming obsolete, due to the gradual increase in white pine acreage and density.

How much of this can be completed during 1950 is questionable. However, every effort will be made to complete it as soon as possible.

The stepped up plan to attain maintenance on all areas, completing initial and re-eradication work in three years, will begin with the 1951 fiscal year. This plan would about double the present force of one checker, GS-5, one wage board checker, one crew leader, and eight laborers. At the present time it would appear that we will have competent personnel to fill the additional positions.

Eradication crews will begin work in late April or by May 1, to take advantage of the early leafing of ribes.

Work during the year was conducted by Ranger J. W. Howell, with Mr. Fields Benton working part of the year as checker. All of the work is under the direction of Chief Ranger Liles. We are fortunate in having available the valuable assistance of Mr. Moore who handled blister rust control work on the Park from its beginning until the time of his promotion to the Regional Office last year.

The tables on pages 43-45 summarizes ribes eradication for 1949, the period 1932-1949, and compares such work with other National Park and Indian Lands in the Southern Appalachian Region.

Research

Ten blister rust resistant grafted white pine, P. strobus, were planted southeast of Hawksbill Gap, on Raywood Mountain, among ribes plants and native pine seedlings for experimental purposes.

Mr. J. Curtis Ball, Forester, and Henry E. Yost, Area Leader of the Blister Rust Control, Bureau of Entomology and Plant Quarantine, planted the foregoing pines and also laid out an experimental plot east of Naked Creek Overlook and sprayed the ribes plants with 2,4,5-Trichlorophenylacetic acid with various methods of application. Within two weeks results of the spraying were evident as ribes leaves dried or withered.

Decapitation of the ribes at the crown or the roots and drenching this with the solution appeared to give best results. Observation of any growth this spring will determine the success of the various methods of application and the 2,4,5-T solution.

Slight variations occur in the figures in this section and those in Tables 10-12. This is due to rounding off fractions in determining totals.

GREAT SMOKY MOUNTAINS NATIONAL PARK

Status of Control

To date nearly 1,000 acres of ribes-bearing control area has been worked and an estimated 75% placed on maintenance. The large part of this will need periodic post checking and perhaps some reworking in the future. It should be borne in mind that placing an area on maintenance indicates a reduced amount of work and not the elimination of control work in the future. A part of one watershed remains to be re-surveyed. Changing conditions due to land acquisition, fire, windthrow or other factors makes blister rust control work a long-range problem even though the amount of work yearly may be relatively small.

In addition, late in 1949 an area of 44,170 acres lying between Fontana Lake and the former Park boundary was transferred to the Park. The status of this area is not definitely known. It is believed to be mostly free of wild ribes. Some ribes were found on or near this land which leaves this question far from settled. A large number of homesites are on it and these may need to be checked for cultivated bushes. Some white pine is known to be present.

The first blister rust on white pine reported in the Park was found by Checker Roy Whaley last spring. We were able to find only one canker which was in an area heavily infected by *Caliciopsis*. The rust on ribes was found generally over the same area of the Park as last year, although less rust was picked up by the scouts. This appears to be a part of a fairly general distribution of rust on ribes found this year in western North Carolina and eastern Tennessee.

Work During 1949

Work during 1949 consisted of post checking, at five-chain intervals, over 6,000 acres in the Cataloochee area of the Park. No immediate need for ribes eradication work was found on any of this control area. A total of 28 homesites were rechecked in the drainage area of Cataloochee and Abrams Creek and Little Liver.

Ribes had previously been found at these 28 homesites. In the course of re-examination only 4 cultivated bushes could be found, all of which were sprouts.

Work Scheduled For 1950-

1. The remainder of the location markers should be set along trails and roads marking the upper limits of the survey from Dicks Gap to Little River.

2. A re-survey should be considered of the white pine in the Park in Swain County, North Carolina. This job will include 44,170 acres recently transferred from TVA to the Park. How much of this can be completed in 1950 is questionable but as much as possible should be surveyed.

3. A check for abandoned cultivated ribes at homesites where they were previously found throughout the Park and in addition all of the homesites on the above mentioned 44,170 acre tract.

4. Post check the remainder of control area in Cataloochee where necessary.

5. All Park personnel should be on the look-out for blister rust infection on pine insofar as they can incidental to their regular duties. This should be a continuous job, but particular emphasis should be placed on it from about March 1 through April 30.

6. Similar examinations should be made of ribes bushes during late August and September. Since the rust has been found generally on ribes at high elevations during two consecutive years we can assume that all of the Park is within "striking range" of the infected pine somewhere in the general vicinity and the rust can be expected to appear in varying amounts each year. This is particularly true since rust was found throughout the counties surrounding the Park in about the same general areas as last year and in addition reported for the first time in Jackson and Macon Counties North Carolina, Union County Tennessee and Union County Georgia.

TABLE 10

SUMMARY OF RIBES ERADICATION ON NATIONAL PARK LANDS - 1949

National Park	Acres Worked			Ribes Destroyed	M-D on Ribes Eradication	Acres Per M-D	Ribes Per Acre
	First Working	Second Working	Other Working	Total Working			
Shenandoah	477	302	851	1,630	13,192	201	11
Great Smoky Mountains**	-	-	-	-	4	-	-
TOTAL	477	302	851	1,630	13,196	201	11

* 462 Acres Ribes-free.

** Only cultivated bushes destroyed at abandoned homesteads.

TABLE II

STATUS OF RIFES ERADICATION ON NATIONAL PARK AND INDIAN LANDS - 1932-1949

National Parks	Total Acres		Acres Worked				Acres On Main- tenance	% On Main- tenance	Unsur- veyed Acres
	Acres White Pine	Acres Control	First Working	Second Working	Other Working				
Shenandoah	3,669	17,610	16,935	6,764	4,669	9,759	55	675	
Blue Ridge Pk'way	5,391	12,581	12,581	856	-	11,545	92	-	
Great Smoky Mts.	66,167	107,722	107,722	413	360	107,836	99	-	
Sub-Total N.Parks	75,227	137,913	137,238	8,033	5,029	148,540	93	675	
INDIAN LANDS									
Cherokee Reservations	22	445	445	-	-	445	100	-	
TOTAL DEPT. OF INTERIOR	75,249	138,358	137,683	8,033	5,029	148,985	93	675	

TABLE 12

SUMMARY OF RIBES ERADICATION BY NATIONAL PARK SERVICE - 1918-1949

National Parks	First Working			Subsequent Workings			All Workings		
	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days	Acres	Ribes Destroyed	Man-Days
Shenandoah	18,602	1,254,387	11,861	15,610	615,041	9,490	34,212	1,869,428	21,351
Blue Ridge Parkway	2,591	17,702	453	350	3,037	192	3,437	21,330	650
Va. N.C.	8,060	561	9	-	-	-	8,060	561	9
Total	10,641	18,263	467	856	3,637	192	11,497	21,900	659
Great Smoky Mountains	21,966	94,682	1,034	3,378	5,303	295	25,344	99,985	1,330
Tenn.	6,319	572	387	-	3	16	6,319	575	403
Total	28,285	95,254	1,421	3,378	5,306	312	31,663	100,560	1,733
TOTAL - ALL PARKS	57,528	1,367,904	13,749	19,844	623,984	9,994	77,372	1,991,888	23,743





Report of
WHITE PINE BLISTER RUST CONTROL
NORTH CENTRAL REGION, 1949

by

Henry N. Putnam
Pathologist

and

J. K. Kroeber
Pathologist

BLISTER RUST CONTROL, NORTH CENTRAL REGION, 1949

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Summary of White Pine Blister Rust Control - December 31, 1949

NORTH CENTRAL REGION

White Pine Being Protected: Natural: 971,224 Acres; Planted: 160,976 Acres;
Total: 1,132,200 Acres. Estimated Value: \$356,000,000.

Status of Control on December 31, 1949. (Net Acres)

I t e m	Forest Service (Acres)	Indian Service (Acres)	Nat. Park Service (Acres)	State and Private (Acres)	Total (Acres)	Percent of Total
W.P. in Control Area	182,957	75,898	15	873,330	1,132,200	-
Total Control Area	375,727	129,264	120	3,405,377	3,910,488	100.0
Worked Initially	282,347	122,195	120	2,552,212	2,956,874	75.6
Worked Twice	139,906	66,567	-	843,463	1,049,936	26.8
Worked More Than Twice	46,899	33,718	-	144,876	225,493	5.8
On Maintenance	170,842	76,650	-	1,029,220	1,276,712	32.6
Needing Initial Work	93,380	7,069	-	853,165	953,614	24.4
Needing Rework	111,505	45,545	120	1,522,992	1,680,162	43.0

Local Control, All Agencies (Gross Acres)

W o r k i n g	Acres		Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected	Acres Worked			Ribes	Man- Days
<u>Calendar Year 1949</u>						
Initial	17,723	60,525	602,649	5,195	10.0	0.09
Second	11,642	29,214	711,364	5,179	24.4	0.18
Third and Other	19,294	35,565	623,750	8,555	17.5	0.24
Total, 1949	48,659	125,304	1,937,763	18,929	15.5	0.15
<u>Cumulative, 1917 to 1949</u>						
Initial	1,057,077	3,445,224	223,148,919	883,738	64.8	0.26
Second	387,652	1,049,936	28,039,311	198,473	26.7	0.19
Third and Other	98,008	225,493	6,066,247	51,901	26.9	0.23
Total, Cumulative	1,542,737	4,720,653	257,254,477	1,134,112	54.5	0.24

Blister Rust Infection: Found initially in 1949 on pine in Carroll Co., Ill.; Wright and Sherburne Cos., Minn.; Green, Lafayette, Walworth, and Washington Cos., Wisconsin. No new counties on ribes. Known on pines and ribes in all seven states; on pine in 187 counties; on ribes in 390 counties of the 622 counties in the Region. Most severe in northern part.

Nursery Sanitation: One nursery in Ill., two in Ohio, one each in Michigan, Minnesota, Wisconsin, worked in 1949. Ribes free zones being maintained around 42 nurseries.

Canker Pruning, 1949: 3,787 cankers removed from 2,676 trees; 422 infected trees removed. Cumulative: 176,602 cankers removed from 82,630 trees. 3,630 infected trees destroyed.

Surveying and Checking, 1949: 37,830 acres control area initially surveyed; 60,715 acres re-surveyed and 33,440 acres retained; 125,389 acres post checked and 105,654 acres retained; 87,083 acres given regular check and 86,685 acres or 99.5 percent found satisfactory.

Cultivated Black Currant Elimination, 1949: 4 plantings, 7 plants found, 8 plantings, 18 plants destroyed. Cumulative: 35,779 plantings, 295,365 plants found, 34,797 plantings, 288,758 plants destroyed.

Control Area Permits, 1949: 626 applications received in 4 States; 550 approved; 31 rejected; 45 voluntarily cancelled.

Motion Pictures, 1949: Regional film shown 201 times to 28,927 people. General film shown 94 times to 21,938 people.

Summary of White Pine Blister Rust Control - December 31, 1949

ILLINOIS

White Pine Being Protected: Natural: 231 Acres; Planted: 1,715 Acres;
Total: 1,946 Acres. Estimated Value: \$1,700,000

Status of Control (Net Acres)

I t e m	Non-Federal			Percent of Total
	Public (Acres)	Private (Acres)	Total (Acres)	
White Pine in Control Area	1,109	837	1,946	-
Total Control Area	6,203	7,194	13,397	100.0
Worked Initially	6,089	5,079	11,168	83.4
Worked Twice	7,104	3,094	10,198	76.1
Worked More Than Twice	7,669	5,003	12,672	94.6
On Maintenance	1,188	1,084	2,272	17.0
Needing Initial Work	114	2,115	2,229	16.6
Needing Rework	4,901	3,995	8,896	66.5

Local Control, All by Bureau-State (Gross Acres)

Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected					Ribes	Man- Days
Calendar Year 1949							
Initial	8	26	5,511	8	213.1	0.31	
Second	5	15	2,024	3	134.9	0.20	
Third and Other	20	50	13,058	23	261.2	0.46	
Total, 1949	33	91	20,623	34	226.6	0.37	
Cumulative, 1932 to 1949							
Initial	3,340	20,056	1,505,103	3,879	75.0	0.19	
Second	2,290	10,198	612,066	2,515	60.0	0.25	
Third and Other	2,776	12,672	547,054	3,532	43.2	0.28	
Total, cumulative	8,406	42,926	2,664,223	9,926	62.1	0.23	

Blister Rust Infection; 1949: No new counties on ribes; on pines for first time in Carroll Co.; Cumulatively found in northern Illinois on pine in 7 counties; on ribes in 24 counties, out of 102 counties in state.

Nursery Sanitation: One state nursery reworked in 1949. Sanitation zones being maintained around 4 of 8 nurseries originally protected.

Surveying and Checking, 1949: 26 acres control area initially surveyed; 2,796 acres post checked, and 2,673 acres retained; 91 acres given regular check after ribes eradication and found satisfactory.

Cultivated Black Currant Elimination: 1949 none; Cumulative: 532 plantings, 4,171 plants found; 60 plantings, 761 plants destroyed.

Summary of White Pine Blister Rust Control, December 31, 1949

INDIANA

White Pine Being Protected: Natural: 323 Acres; Planted: 9,101 Acres;
Total: 9,424 Acres. Estimated Value \$8,000,000

I t e m	Status of Control (Net Acres)				Percent of Total
	Forest Service (Acres)	Non-Federal Public (Acres)	Private (Acres)	Total (Acres)	
W. P. in Control Area	18	2,812	6,594	9,424	-
Total Control Area	179	18,395	171,136	189,710	100.0
Worked Initially	179	17,049	62,067	79,295	41.8
Worked Twice	-	8,972	12,698	21,670	11.4
Worked More Than Twice	-	5,437	3,392	8,829	4.7
On Maintenance	179	13,945	44,249	58,373	30.8
Needing Initial Work	-	1,346	109,069	110,415	58.2
Needing Re-Work	-	3,104	17,818	20,922	11.0

Local Control, All by Bureau-State (Gross Acres)							
Working	Acres		Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected					Ribes	Man- Days
<u>Calendar Year 1949</u>							
Initial	522	2,134	2,900	32	1.4	0.01	
Second	444	1,485	259	8	0.2	0.01	
Third and Other	476	2,859	80	7	Tr.	Tr.	
Total, 1949	1,442	6,478	3,239	47	0.5	0.02	
<u>Cumulative, 1933 to 1949</u>							
Initial	9,177	90,067	439,477	3,939	4.9	0.04	
Second	4,070	21,670	92,438	1,044	4.3	0.05	
Third and Other	1,334	8,829	25,073	271	2.8	0.03	
Total, Cumulative	14,581	120,566	556,988	5,254	4.6	0.09	

Blister Rust Infection; 1949: No new counties. Cumulative: On pine in 3 counties
on ribes in 53 counties of the 92 counties in the State.

Nursery Sanitation: None worked in 1949. Sanitation zones maintained around 2
of the 6 nurseries originally protected.

Canker Pruning; 1949: 7 cankers removed from 6 trees. Cumulative: 11 cankers
removed from 8 trees.

Surveying and Checking, 1949: 1,693 acres control area initially surveyed;
1,029 acres re-surveyed and 973 acres retained; 3,933 acres post-checked
and 4,344 acres retained; 2,385 acres given regular check after eradication
and found satisfactory.

Cultivated Black Current Elimination, 1949: None. Cumulative: 5 plantings,
20 plants found; 3 plantings, 15 plants destroyed.

Summary of White Pine Blister Rust Control - December 31, 1949

IOWA

White Pine Being Protected: Natural 714 Acres; Planted 5,145 Acres
Total: 5,859 Acres. Estimated Value: \$11,000,000 -- chiefly as shelterbelts.

Status of Control (Net Acres)

I t e m	Indian	Non-Federal		Total (Acres)	Percent of Total
	Service (Acres)	Public (Acres)	Private (Acres)		
White Pine in Control Area	45	566	5,248	5,859	-
Total Control Area	500	3,433	46,133	50,066	100.0
Worked Initially	500	3,413	30,390	34,303	68.5
Worked Twice	206	2,203	4,999	7,408	14.8
Worked More than Twice	-	1,217	363	1,580	3.2
On Maintenance	-	58	18,793	18,851	37.7
Needling Initial Work	-	20	15,743	15,763	31.5
Needling Re-Work	500	3,355	11,597	15,452	30.9

Local Control, All Agencies (Gross Acres)

Working	Acres		Ribes Destroyed	Man- Days Used	Per Acre	
	White Pine Protected	Acres Worked			Ribes	Man- Days

Calendar Year, 1949

Initial	13	70	12,414	46	177.3	0.66
Second	23	133	22,668	91	170.4	0.68
Third and Other	180	283	11,309	202	40.0	0.71
Total, 1949	216	486	46,391	339	95.5	0.70

Cumulative 1933 to 1949

Initial	3,410	38,974	3,565,135	27,205	91.5	0.70
Second	1,073	7,408	685,723	5,217	92.6	0.70
Third and Other	487	1,580	127,065	1,319	80.4	0.83
Total, Cumulative	4,970	47,962	4,377,923	33,741	91.2	0.70

Blister Rust Infection, 1949: No new counties. Cumulative: On pines in 9 counties in northeast; on ribes in 56 of the 99 counties in the State.

Nursery Sanitation: None in 1949. Ribes-free zones maintained around 7 of the 9 nurseries originally protected.

Canker Pruning, 1949: 160 cankers removed from 122 trees; 81 infected trees destroyed.
Cumulative: 1,869 cankers removed from 673 trees; 711 infected trees destroyed.

Surveying and Checking, 1949: No survey. 486 acres checked after eradication and found satisfactory.

Cultivated Black Currant Elimination, 1949: 1 planting, 1 plant found; 5 plantings, 12 plants destroyed. Cumulative: 1,611 plantings, 7,331 plants found; 1,606 plantings, 7,310 plants destroyed.

Summary of White Pine Blister Rust Control - December 31, 1949

MICHIGAN

White Pine Being Protected: Natural: 320,138 acres; Planted: 77,759 acres;
Total: 397,897 acres. Estimated value: \$120,000,000

Status of Control (Net Acres)

I t e m	Forest	Nat. Park	Non-Fed.	Private	Total	Percent of Total
	Service (Acres)	Service (Acres)	Public (Acres)			
W.P. in Control Area	61,305	15	128,865	207,712	397,897	-
Total Control Area	161,962	120	309,865	713,488	1,185,435	100.0
Worked Initially	158,867	120	291,970	621,807	1,072,764	90.5
Worked Twice	64,710	-	113,540	249,706	427,956	36.1
Worked More Than Twice	26,621	-	22,385	49,000	98,006	8.3
On Maintenance	110,829	-	130,093	209,797	450,719	38.0
Needing Initial Work	3,095	-	17,895	91,681	112,671	9.5
Needing Re-Work	48,038	120	161,877	412,010	622,045	52.5

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre Ribes	Man- Days
		Calendar Year 1949				
Initial	3,618	14,398	74,304	578	5.2	0.04
Second	4,113	9,524	16,519	223	1.7	0.02
Third and Other	6,633	13,000	54,210	998	4.2	0.08
Total, 1949	14,364	36,922	145,033	1,799	3.9	0.05
		Cumulative 1928 to 1949				
Initial	437,622	1,329,813	65,416,985	280,351	49.2	0.21
Second	158,395	427,956	8,182,600	54,866	19.1	0.13
Third and Other	39,375	98,006	1,139,840	11,285	11.6	0.12
Total, Cumulative	635,392	1,855,775	74,739,425	346,502	40.3	0.39

Blister Rust Infection, 1949: No new counties. Cumulative: On pines in 52 counties; on ribes in all of the 83 counties in State. Particularly severe in Upper Michigan

Nursery Sanitation, 1949: Chittenden Nursery and Annex reworked. Cumulative: Ribes-free zones maintained around 7 of the 13 nurseries originally protected.

Canker Pruning, 1949: 238 cankers removed from 95 trees; 6 infected trees destroyed. Cumulative: 102,176 cankers removed from 41,691 trees; 297 infected trees destroyed.

Surveying and Checking, 1949: 14,590 acres control area initially surveyed; 11,595 acres resurveyed and 5,699 acres retained; 53,491 acres post-checked and 47,440 acres retained; 36,922 acres checked after eradication and found satisfactory.

Cultivated Black Currant Elimination, 1949: 3 plantings, 6 plants found and destroyed. Cumulative: 14,931 plantings, 147,849 plants found; 14,864 plantings, 147,195 plants destroyed.

Control Area Permits, 1949: 218 applications received; 167 approved; 17 rejected and 34 voluntarily cancelled.

Summary of White Pine Blister Rust Control - December 31, 1949

MINNESOTA

White Pine Being Protected: Natural 237,324 acres; Planted: 12,676 acres;
Total: 250,000 acres. Estimated Value: \$75,000,000

Status of Control (Net Acres)

I t e m	Forest	Indian	Non-Fed.	Private	Total	Percent
	Service	Service	Public			
	(Acres)	(Acres)	(Acres)	(Acres)	(Acres)	of Total
W.P. in Control Area	87,704	21,817	54,047	86,432	250,000	-
Total Control Area	143,465	32,172	112,274	271,700	559,611	100.0
Worked Initially	60,760	32,129	75,084	204,411	372,384	66.5
Worked Twice	26,882	26,768	22,226	46,039	121,915	21.8
Worked More Than Twice	11,745	19,492	5,378	1,806	38,421	6.9
On Maintenance	27,549	24,448	24,270	36,201	112,468	20.1
Needing Initial Work	82,705	43	37,190	67,289	187,227	33.5
Needing Re-Work	33,211	7,681	50,814	168,210	259,916	46.4

Local Control, All Agencies (Gross Acres)

Working	Acres	Acres	Ribes	Man-	Per Acre	
	White Pine				Ribes	Man-
	Protected	Worked	Destroyed	Days		Days
<u>Calendar Year 1949</u>						
Initial	2,242	3,265	219,489	2,161	67.2	0.66
Second	1,990	3,301	325,473	2,399	98.6	0.73
Third and Other	3,085	4,305	200,207	2,995	46.5	0.70
Total	7,317	10,871	745,169	7,555	68.5	0.69
<u>Cumulative 1917 to 1949</u>						
Initial	176,969	424,748	62,034,604	167,640	146.0	0.39
Second	63,272	121,915	8,238,481	44,805	67.6	0.37
Third and Other	25,621	38,421	2,560,978	18,337	66.7	0.48
Total, Cumulative	265,862	585,084	72,834,063	230,782	124.5	0.39

Blister Rust Infection, 1949: Initially on pines in Wright and Sherburne Counties.
Cumulative: On pines in 38 counties; on ribes in 38 of the 87 counties in the State. Rust prevalent in all pine growing counties, and especially severe in northeastern Minnesota.

Nursery Sanitation, 1949: One state nursery reworked. Cumulative: Ribes-free zones maintained around 6 of the 17 nurseries originally protected.

Canker Pruning, 1949: 3,382 cankers removed from 2,453 trees; 335 infected trees destroyed. Cumulative: 71,318 cankers removed from 39,653 trees; 2,609 infected trees destroyed.

Surveying and Checking, 1949: 2,937 acres control area initially surveyed; 11,023 acres resurveyed and 5,131 acres retained; 22,570 acres post-checked, and 18,881 acres retained; 10,521 acres checked after eradication, and 10,123 acres found satisfactory.

Cultivated Black Currant Elimination, 1949: None. Cumulative: 3,261 plantings, 23,309 plants found and destroyed.

Control Area Permits, 1949: 100 applications received; 84 approved; 5 rejected; 11 voluntarily cancelled.

Summary of White Pine Blister Rust Control December 31, 1950

OHIO

White Pine Being Protected. Natural: 3,152 acres; Planted: 17,901 acres;
Total: 21,053 acres. Estimated value: \$18,000,000

I t e m	Status of Control (Net Acres)			Total (Acres)	Percent of Total
	Forest Service (Acres)	Non-Fed. Public (Acres)	Private (Acres)		
W.P. in Control Area	520	5,805	13,728	21,053	-
Total Control Area	4,341	55,550	396,114	456,005	100.0
Worked Initially	4,029	40,847	135,712	178,588	39.2
Worked Twice	-	19,490	30,909	50,399	11.1
Worked More Than Twice	-	3,762	11,348	15,110	3.3
On Maintenance	4,029	14,251	66,507	84,787	18.6
Needing Initial Work	312	14,703	262,402	277,417	60.8
Needing Re-Work	-	26,536	67,205	93,801	20.6

Working	Local Control, All Bureau-State (Gross Acres)				Per Acre	
	White Pine Protected	Acres Worked	Ribes Destroyed	Man- Days Used	Ribes	Man. Days
Calendar Year 1949						
Initial	961	3,493	23,031	99	6.6	0.03
Second	621	3,038	1,350	28	0.4	0.01
Third and Other	110	754	83	5	0.1	0.01
Total 1949	1,692	7,285	24,464	132	7.1	0.05
Cumulative 1933 to 1949						
Initial	16,736	209,773	2,570,366	33,007	12.3	0.16
Second	6,068	50,399	723,874	12,433	14.4	0.25
Third and Other	3,104	15,110	170,121	2,421	11.3	0.16
Total Cumulative	25,908	275,282	3,464,361	47,861	18.6	0.57

Blister Rust Infection, 1949: No new counties. Cumulative: On pines in 10 counties; on ribes in 65 counties, of the 88 counties in the State.

Nursery Sanitation, 1949: 2 nurseries worked initially. Cumulative: Ribes-free zones maintained around 7 of the 16 nurseries originally protected

Canker Pruning, 1949: None. Cumulative: 126 cankers removed from 14 trees; 3 infected trees destroyed.

Surveying and Checking, 1949: 2,074 acres control area initially surveyed; 4,410 acres resurveyed, and 1,678 acres retained; 12,098 acres post-checked and 3,534 acres retained; 3,270 acres given regular check after eradication and found satisfactory.

Cultivated Black Currant Elimination, 1949: None. Cumulative: 8,848 plantings; 75,605 plants found; 8,406 plantings; 73,117 plants destroyed.

Control Area Permits, 1949: 33 applications received; 24 approved, and 9 rejected.

Summary of White Pine Blister Rust Control, December 31, 1949

WISCONSIN

White Pine Being Protected: Natural 409,342 acres; Planted: 36,679 acres;
Total: 446,021 acres. Estimated value: \$133,000,000

Status of Control (Net Acres)

Item	Forest Service (Acres)	Indian Service (Acres)	Non-Ped.		Total (Acres)	Percent of Total
			Public (Acres)	Private (Acres)		
W. P. in Control Area	33,410	54,036	96,965	261,607	446,021	-
Total Control Area	65,780	96,592	267,265	1,026,627	1,456,264	100.0
Worked Initially	58,512	89,566	264,899	795,395	1,208,372	83.0
Worked Twice	48,314	39,593	87,913	234,570	410,390	28.2
Worked More Than Twice	8,533	14,226	12,182	15,934	50,875	3.5
On Maintenance	28,256	52,202	139,155	329,629	549,242	37.7
Needing Initial Work	7,268	7,026	2,366	231,232	247,892	17.0
Needing Re-Work	30,256	37,364	125,744	465,766	659,130	45.3

Local Control, All Agencies (Gross Acres)

Working	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man- Days Used	Per Acre	
					Ribes	Man- Days
<u>Calendar Year 1949</u>						
Initial	10,359	37,139	264,970	2,271	7.1	0.06
Second	4,446	11,718	343,071	2,427	29.3	0.21
Third and Other	8,790	14,314	344,803	4,325	24.1	0.30
<u>Total, 1949</u>	<u>23,595</u>	<u>63,171</u>	<u>952,844</u>	<u>9,023</u>	<u>15.1</u>	<u>0.14</u>
<u>Cumulative 1917 to 1949</u>						
Initial	409,823	1,331,793	87,617,249	367,717	65.8	0.28
Second	152,484	410,390	9,504,129	77,593	23.2	0.19
Third and Other	25,311	50,875	1,496,116	14,736	29.4	0.29
<u>Total Cumulative</u>	<u>587,618</u>	<u>1,793,058</u>	<u>98,617,494</u>	<u>460,046</u>	<u>55.0</u>	<u>0.26</u>

Blister Rust Infection, 1949: Initially on pines in Green, Lafayette, Walworth, and Washington Counties. Cumulative: On pines in 63 counties; on ribes in all of the 71 counties in the State.

Nursery Sanitation, 1949: One state nursery reworked. Cumulative: Ribes-free conditions maintained around 9 of the 17 nurseries originally protected.

Canker Pruning, 1949: None. Cumulative: 1,102 cankers removed from 561 trees.

Surveying and Checking, 1949: 16,510 acres of control area initially surveyed, 32,658 acres resurveyed and 19,959 acres retained; 30,501 acres post-checked, and 28,782 acres retained; 33,408 acres checked after eradication and found satisfactory.

Cultivated Black Currant Elimination, 1949: None. Cumulative: 6,601 plantings, 37,080 plants found; 6,597 plantings, 37,051 plants destroyed.

Control Area Permits, 1949: 275 applications received, 275 approved.

CHART 1

LOCATION OF BLISTER RUST CONTROL OFFICES NORTH CENTRAL REGION

1949

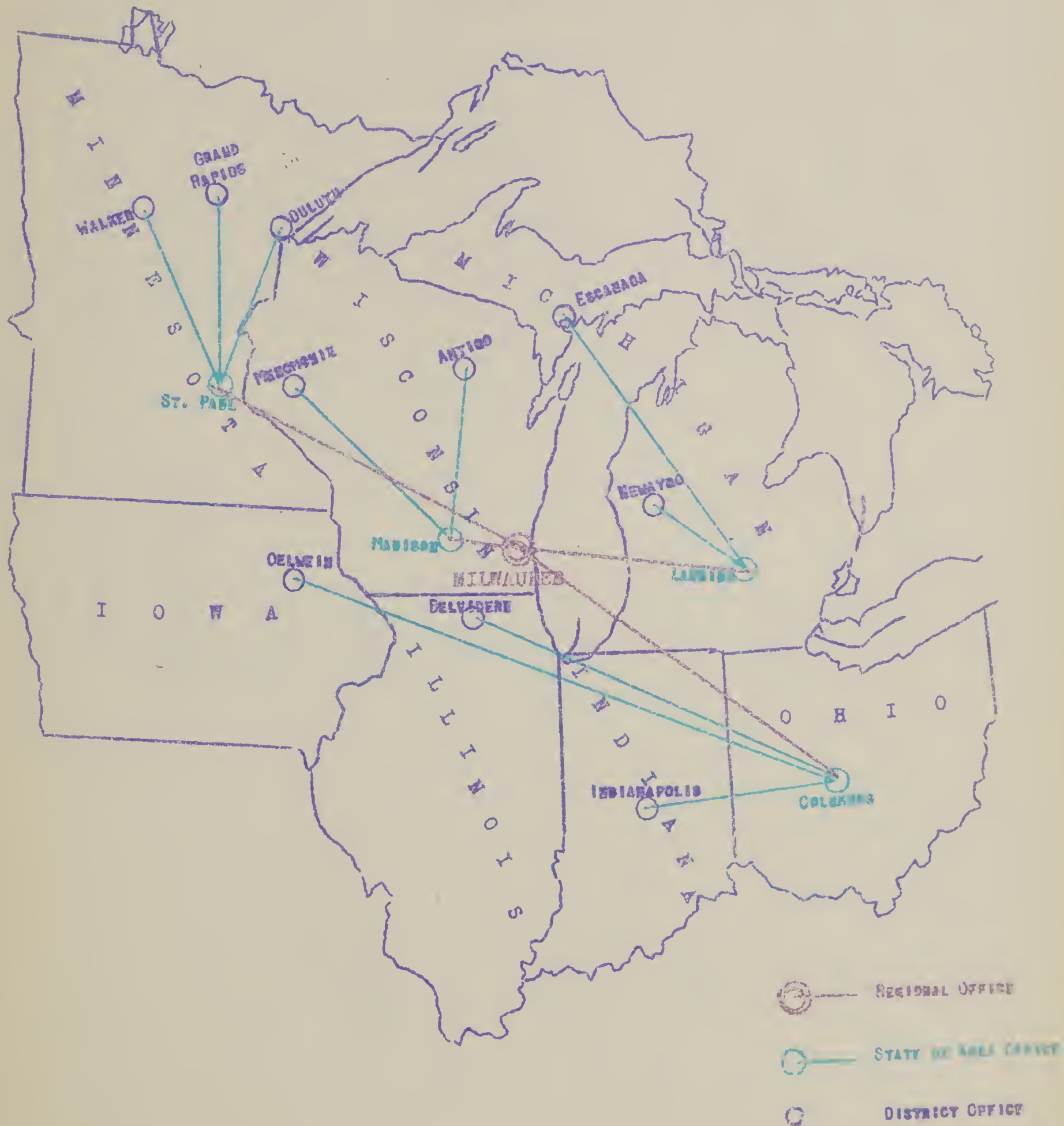
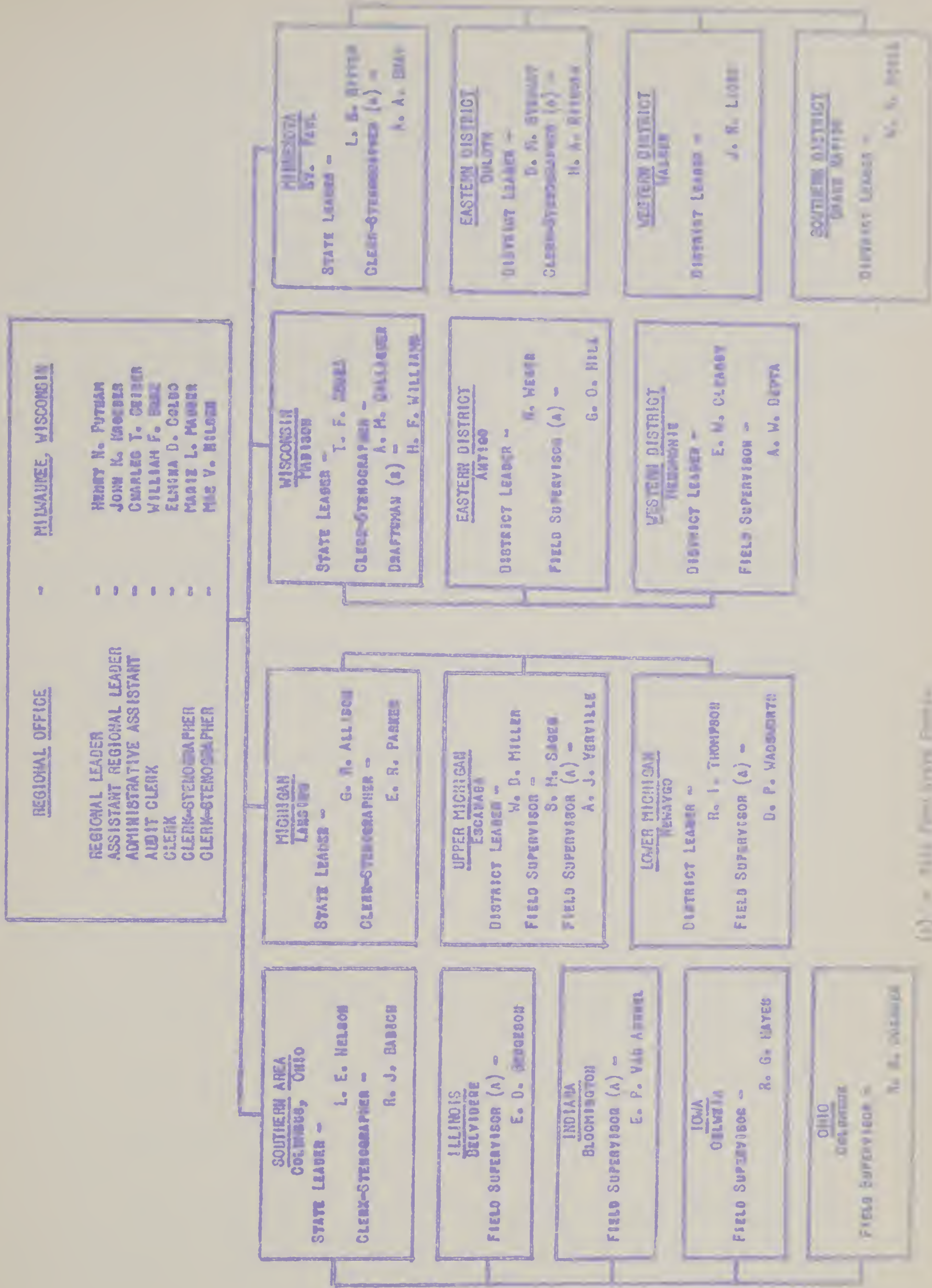


CHART 2

ORGANIZATION CHART, NORTH CENTRAL REGION, AS OF DECEMBER 31, 1940



Detailed Narrative Report, 1949

Foreword

As initiated in 1942, the organization of the 1949 Report follows the same pattern. It is divided into four main parts, so arranged that separates will be available covering control work on National Forests and Indian Reservations to these respective agencies. The four divisions are listed below:

(1) BLR-1-3. Leadership, Coordination and Technical Direction. This includes summaries, general narrative section, and tables covering all activities. Local control work is included for completeness.

(2) BLR-3-3. Cooperative Blister Rust Control on State and Privately Owned Lands. This includes tables and a discussion by States of work done and status of control on lands in non-federal public and private ownership.

(3) BLR-4. Blister Rust Control Operations on National Forests. This includes tables and discussions of work done and status of control on each of the 11 white pine growing National Forests in this Region.

(4) BLR-7. Blister Rust Control Operations on Indian Reservations. This includes tables and discussions of work done and status of control on each of the 10 Indian Reservations producing white pine in this Region.

BLR-1-3. Leadership, Coordination and Technical Direction of
White Pine Blister Rust Control, North Central Region

Organization

Permanent Organization

The permanent organization as of December 31, 1949, is shown in the accompanying chart. Several changes in the organization took place during the Calendar Year 1949. Details of these changes are as follows:

Mrs. Katherine A. Dunham transferred to the Bureau of Internal Revenue at Milwaukee effective May 2, 1949.

Mrs. Lorraine Z. Heise, Clerk-Stenographer, went on maternity leave-without-pay effective January 11, 1949.

Miss Mae V. Nilson, Clerk-Stenographer, on detail from the Forest Service Regional Office, transferred to our Milwaukee Regional Office effective July 1, 1949, to fill the Clerk-Stenographer vacancy due to Mrs. Heise entering on extended leave-without-pay.

Labor Conditions

Labor for eradication crews in 1949 was largely obtained from the vicinity of each job and transported to work either by privately owned automobiles operated at no expense to the government, or, in some cases, by government cars. Labor was generally more available than in recent years. It was possible to be selective, and to employ a high proportion of experienced workers. Young men, mostly forestry students, were employed particularly in Forest Service camps on the Superior National Forest, Minnesota. Indian women continued to be used as labor on Indian reservations, although the proportion of them to men was lower in 1949.

Bureau rates were 85¢ for unskilled labor; 95¢ for scouts and checkers; \$1.05 for crew leaders and \$1.15 for foremen per hour.

Man-Months Employment

There were employed in 1949 approximately 1,445 man-months (Table 13), compared with 1,581 in 1948 and 1,861 in 1947. In comparison with 1948 there were increases in 1949 in man-months employed on state and private funds from 225 to 304; on the Forest Service program, a decrease from 429 to 402; and on the Indian Service program from 515 to 380 man-months. However, there was a reduction on Bureau Administrative Funds from 257 to 249; and on Bureau Cooperative Funds from 154 to 110 man-months due to reduction in Bureau funds in Fiscal Years 1949 and 1950.

Automotive Equipment

Five 1949 Ford 4-door sedans, ordered in 1948, were delivered during January and February, 1949. One passenger car and nine trucks were disposed of during 1949. At the end of 1949 we had thirteen passenger cars and thirty-six trucks, shown by year of manufacture as follows:

1937	1 passenger car	1 truck
1939	0 passenger cars	11 trucks
1940	1 passenger car	2 trucks
1941	1 passenger car	1 truck
1947	5 passenger cars	21 trucks
1949	5 passenger cars	0 trucks
Total . . .	13 passenger cars	36 trucks

Automobiles on Hand, January 1, Each Year

Type	1942	1943	1944	1945	1946	1947	1948	1949	1950
Passenger Cars	21	18	13	12	13	12	16	9	13*
Trucks	56	44	37	36	34	34	47	45	36
Total	77	62	50	48	47	46	63	54	49

* One new passenger car will be delivered in F.Y. 1950

Government Autos in Use, 1949, North Central Region

Make	Model	Year	On Hand Jan. 1, 1949	Received During 1949	Sold or Declared Surplus 1949	On Hand Jan. 1, 1950
<u>Passenger Cars</u>						
Ford	Sedan, 4-Door	1949	0	5	0	5
Chevrolet	Standard Coach	1940	1	0	0	1
Studebaker	Champion Coach	1941	2	0	1	1
Pontiac 6	Sedan, 4-Door	1937	1	0	0	1
Pontiac	Sedan, 4-Door	1947	4	0	0	4
Plymouth	Sedan, 4-Door	1947	1	0	0	1
Total Passenger Cars			9	5	1	13
<u>Trucks</u>						
Ford	Pick-up	1937	2	0	1	1
Ford	1-1/2 Ton Stake	1947	3	0	0	3
Ford	Sedan Delivery	1940	1	0	0	1
Chevrolet	Sedan Delivery	1947	18	0	0	18
Chevrolet	Sedan Delivery	1937	2	0	2	0
Chevrolet	Sedan Delivery	1939	2	0	1	1
Chevrolet	Pick-up	1940	1	0	1	0
Chevrolet	Sedan Delivery	1940	1	0	0	1
Chevrolet	1-Ton Panel	1941	1	0	0	1
Plymouth	Pick-up	1939	13	0	3	10
Dodge	1-1/2 Ton	1939	1	0	1	0
Total Trucks			45	0	9	36
Total Automobiles			54	5	10	49

Automobile Accidents

There were two automobile accidents involving government-owned vehicles in 1949. These accidents were of a minor nature, resulting in property damages only to the vehicles involved. No personal injuries sustained. In 1949, 388,838 miles were driven in 49 government-owned cars. Thus, there was one automobile accident per 191,419 miles of travel. Details of the two minor automobile accidents follow:

1. Ford Sedan, 1949 - License A-5207
Driver - William R. Doell
Passengers - One
Place - Grand Rapids, Minnesota
Date of Accident - April 14, 1949
Cause - Operator of private car backed out of parking space into side of Government car.
Damage to Government car - Left rear fender.
Repairs - \$6.00 paid by owner of private car.
Damage to other car - None
Injuries - None
2. Ford Sedan, 1949 - License A-5247
Driver - Robert G. Doerner
Passengers - None
Place - Columbus, Ohio
Date of Accident - September 15, 1949
Cause - Government car entered intersection when light changed to green before the intersection had been cleared of cross traffic, resulting in Government car being hit on left side by privately owned and operated automobile.
Damage to Government car - Front left fender, bumper and wheel and left rear door.
Repairs - \$93.58, paid by Government.
Damage to other car - Front right bumper, fender and light.
Injuries - None

Compensation Cases

During 1949 there were four compensation cases processed through the Milwaukee Office, for persons employed on 73.14, W-a.14 and W-A.14 funds. In Wisconsin an employee sustained a cut forefinger on left hand, in Minnesota an employee had a left elbow injury, in Milwaukee an employee sustained an eye injury and no time was lost in these cases. In Michigan an employee suffered an eye injury and lost 16 hours which was covered by sick leave.

The number of compensation cases processed through the Milwaukee Office from 1936 to 1949 are shown in the following table by years and types of injury. These covered men employed on federal WPA programs, and on Bureau funds, both administrative and matching during the 14 years. The smallest number of cases, three, were reported in 1948. The lowest rate occurred in 1937 with 2.84 cases per 1000 man-months. This year was the first for several years in which weather conditions were cool and moist during the summer months. The highest rate was in 1945, increased chiefly by a serious automobile accident injuring eight men in northeastern Minnesota. A 1-1/2 - ton truck carrying eradication workers was hit and overturned by a Greyhound bus.

As would be expected in woods work, cuts, sprains and bruises, ivy poisoning, and eye injuries accounted for more than 84 percent of the 354 cases. Ivy poisoning cases varied considerably by years. For the period 1938 to 1941 these cases were most common in relation to other types. Several factors were responsible for this variation including geographical distribution of work, individual susceptibility of workers, weather conditions, use of Ivy-Tox, etc.

We have always stressed the importance of reporting even minor injuries. In the great majority of cases reported injuries were minor, and little, if any, lost time resulted. No fatal injuries occurred, and very few men had to be hospitalized.

As a preventive measure, all camps, crews, automobiles are equipped with first aid kits, and most of the supervisors have been given training in first aid.

Compensation Cases Processed Through the Milwaukee Office,
North Central Region, 1936 to 1949

Calendar Year	Heat and Frost Injury	Dog Bites	Insect Caused Injury	Eye Injury	Ivy and Other Plant Poisoning	Infection	Cuts Sprains Fractures Bruises	Total	Number of Man Months	Cases per 1000 Man Months
1936	3	-	4	22	16a	8	34	87	12,033	7.23
1937	-	-	-	5	2	2	4	13	4,583	2.84
1938	-	-	-	13	19	7	15	54	4,977	10.85
1939	1	3	3	8	26	1	7	49	4,458	10.75
1940	-	1	2	5	13	2	11	34	3,469	9.30
1941	-	1	1	7	12	3	8	32	3,516	9.10
1942	-	-	-	-	1	3	1	5	442	11.29
1943	-	-	-	1	2	-	1	4	440	9.09
1944	-	-	-	1	-	1	3	5	461	10.85
1945	-	-	-	3	2	3	13b	21b	764	27.49
1946	-	-	-	5	8	5	14	32	1,579	20.27
1947	-	-	-	2	2	1	6	11	883	12.46
1948	-	-	-	-	2	-	1	3	411	7.30
1949	-	-	-	2	-	-	2	4	359	11.14
Total	4	5	10	74	105	36	120	354	38,375	9.22
Percent	1.1	1.4	2.8	20.9	29.7	10.2	33.9	100.0		

a - Includes 2 organic disease cases.

b - Eight of these due to one serious automobile accident in Minnesota.

Construction and Equipment

By transfer from surplus lists of other agencies we obtained, without cost, such items as a multiwing display fixture, cameras, drafting tables, fans, desks, chairs, etc. Most of this equipment was for use in our field offices.

Authorization and Sources of Funds

As in the past several years, the work in 1949 was continued under Memoranda of Agreement drawn up between the responsible State Agencies and the Bureau of Entomology and Plant Quarantine. These, with the exception of the new agreement with Iowa, which is shown in the 1945 Regional Report, are shown in the 1936 Regional Annual Report, and are not repeated here.

During 1949, work was performed on funds furnished from the following sources:

1. State and Private

- a. Direct aid (Ribes eradication matched by 73.14 and W-e.14 Federal)
- b. Indirect aid (Other services)

2. Federal Blister Rust Appropriation

- a. 71.14 and W-e.14 Leadership, coordination, and technical direction
- b. 73.14 and W-e.14 Cooperative blister rust control on State and private lands. (Matched by State direct aid)
- c. 74 Blister rust control on National Forests in Michigan, Minnesota, and Wisconsin
- d. 77 Blister rust control on Indian Reservations in Minnesota and Wisconsin (Matched by Tribal funds on the Menominee Indian Reservation)

Spread of the Rust

Rust on ribes was not reported initially from any county in the region in 1949. Pine infection was found initially in 1949 in seven counties, namely: Carroll County, Illinois; Wright and Sherburne Counties, Minnesota; Green, Lafayette, Walworth and Washington Counties, Wisconsin.

In the Southern Area ribes infection was generally light except in northeastern Iowa. High temperatures and lack of rain in Ohio, Indiana and Illinois during the growing season retarded development of rust on ribes. In northeastern Iowa, where ribes are abundant and closely associated with

white pines, and rust is prevalent, infection on ribes was heavy. In an unprotected planted white pine stand of 4 acres, in Clayton County, over 40 percent of the trees were found infected in 1949.

In Michigan, Minnesota and Wisconsin ribes infection was abundant in the northern parts, where the proximity of fruiting cankers yearly causes heavy ribes infection despite adverse weather conditions. Additional pine infection centers and intensification of the rust on pines in unprotected stands were found in 1949. From canker analyses 1943 and 1944 were years of heavy pine infection.

Known spread of the rust on pines and ribes to the end of 1949 is shown in the following table and in Chart No. 3. Ribes infection has been found in all of the important pine producing counties, and pine infection in most of them.

Counties in Which White Pine or Ribes Infection Has Been
Found to December 31, 1949 - North Central Region

State	Total Number of Counties	Number of Counties with Infection				Percent Counties with Rust	
		Found		Cumulative			
		Initially 1949 on Pines	On Ribes	to 12/31/49 On Pines	On Ribes	On Pines	On Ribes
Illinois	102	1	-	7	24	7%	24%
Indiana	92	-	-	3	53	3	58
Iowa	99	-	-	9	56	9	56
Ohio	88	-	-	10	65	11	74
Michigan	83	-	-	52	83	63	100
Minnesota	87	2	-	38	38	44	44
Wisconsin	71	4	-	68	71	96	100
Region	622	7	-	187	390	30	63

The status of the rust at the end of 1949 in each of the states was as follows:

Illinois

In 1949 pine infection was found for the first time in Carroll County on young natural pine. No rust was found on ribes for the first time in new counties. A total of 890,000 white pines in 28 counties was examined. No rust was found on 6,400 wild ribes and 39 cultivated black currants inspected in six counties. Weather was too hot and dry for optimum spread in 1949. To date pine infection has been found in seven counties on pines and in 24 counties on ribes, all in the northern part of the state.

Indiana

No new centers of infection were found in Indiana in 1949, either on pines or ribes. Additional cankers were found in two known infection centers in Elkhart and LaGrange Counties. Rust on ribes was very light in 1949.

To date infection has been in three counties, two of which are still active in extreme north of state, and one, in extreme southwest, found in 1911 on imported pines and destroyed. On ribes rust has been found in 53 counties in northern two-thirds of the state, mostly in 1947.

Iowa

No new counties were added to the list with infected pines or ribes in 1949. In an unprotected, planted 4-acre stand of white pine in Clayton County, over 40 percent of the trees were found infected in 1949. Ribes infection was heavy in the northeastern counties.

To date rust on pines has been found in nine northeastern and on ribes in 56 northern counties of the 99 counties in the state.

Ohio

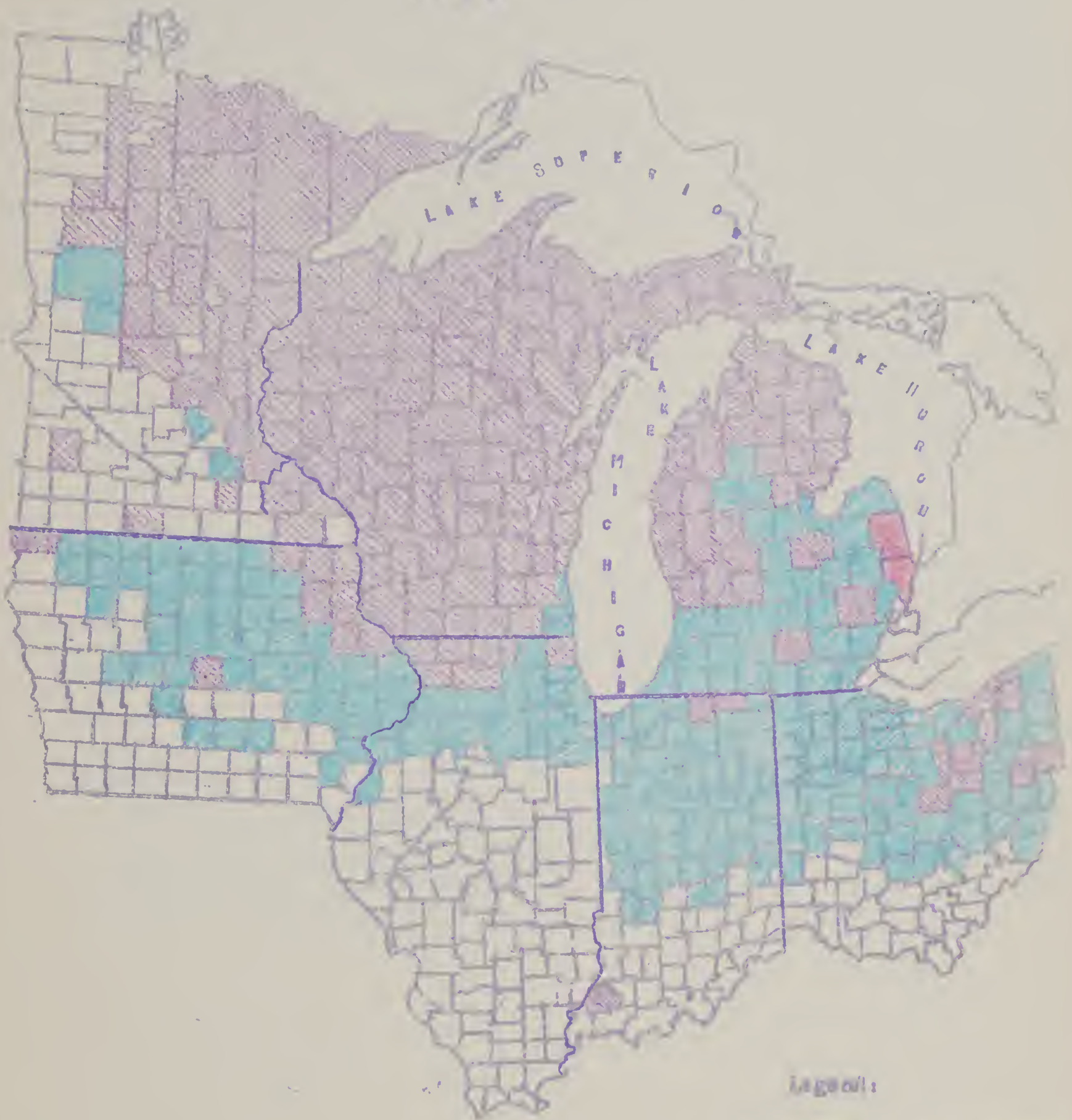
Neither pine nor ribes infection was found in new counties in Ohio this year. Infection on ribes in counties where it had been found before was found to be generally light because of the dryness of the summer. To date, rust on pines has been found in 10 and on ribes in 65 of the 88 counties in the State.

Michigan



No new counties were added to the list of those having pine infection. However, a continuing increase in the number of cankers in unprotected stands in counties known to have pine infection was observed. Ribes infection has previously been found in all counties. Due to the dryness of the season it was not as intense in 1948 and 1949 as in some other years. To date rust on white pine has been found in 52 counties. Rust is particularly damaging to unprotected stands in the western half of the Upper Peninsula and in a few counties in the northern portion of Lower Michigan.

A decided increase in pine infection was found in Isle Royale National Park in 1949. In 6 years, since 1944, pine infection increased from a few scattered cankers to moderate infection all over the Park. Cankers originated chiefly in 1943 and 1944. Except for one small area of 15 acres, no protection work has been done in this Park, although plans for such control work around a few areas have been made.

YEAR 5
 SEASON OF BLISTER RUST INFECTION
 NORTH CENTRAL REGION
 1949



Legend:

-  Pine Infection with or without Ribes Infection Reported
-  Ribes Infection Only

Minnesota

No ribes or pine infection was reported in 1949 from new counties, because it is now thoroughly established in the white pine belt, and no scouting was done outside of this area. It seems probable that rust on ribes could be found in practically every county, if a search were made. Pine infection in 1949 continued to intensify in unprotected stands in the northeastern part of the State. Surveys made this year, disclosed so much destruction of young pines from blister rust that several hundred acres of young pine were removed from the control problem because of the loss of pine values. As part of the reappraisal of the control problem on the Superior National Forest in 1949, 7,483 white pine trees on 1,755 plots distributed in worked and unworked areas were examined, and 877 trees, or 11.7 percent were found infected. In areas never worked, or worked initially and not reworked in time, pine infection was heavy, up to 70 percent. In areas properly protected, however, pine infection had been kept to a low level of 5 percent or less.

To date, rust on pines has been reported from 38 counties and on ribes from 38 counties. However, these are not the same counties. In four of them ribes, but not pine infection, has been found, and in four others pine infection but not ribes infection has been reported. Ribes infection is undoubtedly present in these counties also.

Wisconsin

Pine infection was found in 1949 for the first time in Green, Lafayette, Walworth and Washington Counties, bringing the total number of counties in which the disease has been found in Wisconsin to 68. Previously rust on ribes has been found in all of the 71 counties in the state.

White Pine

Values

The present stand of white pine listed as worth protection costs, 1,132,200 acres, is only a small fraction of the estimated 30,000,000 acres in the original virgin white pine stands in the three lake states. As would be expected existing stands are composed largely of trees in the sapling and reproduction classes, as shown in the following table:

Acres of White Pine in Control Problem,
Classified by States and Age Classes, All Ownerships
North Central Region, 1949

(Rounded to hundreds)

State	Mature (Acres)	Poles (Acres)	Saplings (Acres)	Reproduction (Acres)	Total (Acres)
Illinois	200	900	300	500	1,900
Indiana	500	100	5,700	3,100	9,400
Iowa	2,500	1,500	1,100	800	5,900
Ohio	100	2,000	7,000	12,000	21,100
Michigan	87,600	72,500	74,400	163,400	397,900
Minnesota	27,000	80,400	77,000	65,600	250,000
Wisconsin	20,100	56,800	80,700	283,400	446,000
Region	118,000	214,200	246,200	513,800	1,132,200
Percent of Total	12%	19%	22%	47%	100%

On the basis of expected yields per acre at maturity of 35 M board feet in Indiana, Illinois and Ohio; 20 M board feet in Iowa; and 12 M board feet in Michigan, Minnesota and Wisconsin, (arrived at after consultations with numerous foresters in the region) the present and future stumpage values of this acreage of white pine is calculated to be 14,250,800 M board feet. At an average stumpage of \$25 per M board feet, this amounts to over \$356,000,000. In addition white pines have high but intangible, aesthetic and protection values.

Surveys

Table 1 indicates the large amount of survey work done in 1949. A total of 69,046 acres of pine and 223,934 acres of control area was mapped. The application of these survey and post check figures to the total control problem as it existed in 1948, resulted in acres of white pine in 1949 remaining about the same - an increase of 713 acres. However, there was a decrease of over 26,000 acres of control area, due chiefly to a reduction in width of protection zones in 1949 of areas worked or originally surveyed several years ago.

While the total acreage of white pine in the regional control problem remained roughly the same in 1949 as it was in 1948, there were shifts in locations of white pine to be protected. Reappraisal so far of white pine stands on the Superior National Forest, Minnesota, resulted in throwing out about 11,000 acres of white pine because of damage from rust, too costly to work, insufficient pine values, etc. This loss was more than made up, however, by additions to the control problem of 3,500 acres of white pine on Indian Reservations in Wisconsin; 3,000 acres of Forest Service ownership in Michigan; and 5,000 acres of

state and privately owned pine stands in Indiana, Ohio, Minnesota and Wisconsin. Increases in Indiana and Ohio were due to new plantations, and in the other states primarily to reproduction coming in naturally, as a result of favorable growing seasons during the last decade.

Trends in White Pine Stands

Beginning in 1932 the total acreage of white pine which should be protected against the rust has been recorded by states and later by ownership classes. The earliest figures were necessarily estimates based on whatever information was available and on very extensive surveys. During the CCC and other emergency relief programs, 1933 to 1939, a large amount of survey work was done. By 1939 nearly all of the white pine acreage listed had been given some kind of survey and mapped. Standards of minimum number of white pine stems by age classes had been devised. Unavoidably much of this survey work was done by inexperienced men. Later surveys have shown that considerable acreages mapped as white pine did not have sufficient values to be worth working.

Also in those early years white pine planting sites were included in the problem. Later all planting sites, except those to be planted within a year, were excluded from the problem. During the war years there was extensive logging of white pine in the young mature and pole sizes because of the good price obtained. Many of these areas reverted to hardwoods after logging.

To offset these reductions there has been an active white pine planting started in the emergency relief programs on a large scale. Particularly in the Southern Area there is a sustained demand for white pine planting stock on the part of the public. The size of the planting program is limited chiefly by availability of planting stock. Also since 1937 frequent rains during the growing season each year have encouraged natural white pine reproduction. There are now substantial acreages of white pine up to ten years old which are being mapped and added to the control problem.

The following table shows by states the acres of pine listed for protection each year since 1932. The information from 1934 to 1949 is shown graphically in Chart 3-A.

Acres of White Pine in Control Problem at End of Year as Shown

North Central Region

Year	Ill.	Ind.	Iowa	Ohio	Mich.	Minn.	Wiso.	Region
1932	1,600	1,700	2,400	54,900	1,027,446	1,043,730	756,315	2,888,091
1933	1,600	1,700	2,400	54,900	1,027,446	1,043,730	756,315	2,888,091
1934	1,200	630	4,000	3,151	575,832	356,436	585,960	1,527,209
1935	1,200	1,000	5,000	12,300	545,218	362,616	327,060	1,254,394
1936	1,185	2,682	5,000	7,045	545,218	362,616	327,060	1,250,806
1937	2,068	4,287	5,100	8,490	560,520	232,122	349,227	1,161,814
1938	2,968	3,998	5,600	11,503	586,691	247,587	361,406	1,219,753
1939	3,004	4,750	5,600	14,010	586,691	280,910	363,963	1,258,928
1940	3,289	6,056	3,934	15,358	459,106	264,397	363,963	1,116,103
1941	3,455	6,351	3,955	17,038	443,187	261,562	387,000	1,122,548
1942	3,524	7,249	5,000	33,771	446,454	285,680	390,649	1,172,327
1943	3,508	7,911	5,000	35,713	441,914	282,808	376,560	1,153,414
1944	2,219	6,656	5,300	18,362	444,019	278,193	382,478	1,137,227
1945	2,155	6,948	5,656	19,006	441,743	279,727	392,117	1,147,352
1946	2,103	8,820	5,792	20,169	417,193	276,868	417,397	1,148,342
1947	1,923	8,567	5,845	20,230	402,760	266,553	429,815	1,135,693
1948	1,943	8,809	5,852	20,420	395,238	259,316	439,909	1,131,487
1949	1,946	9,424	5,859	21,053	397,897	250,000	446,021	1,132,200

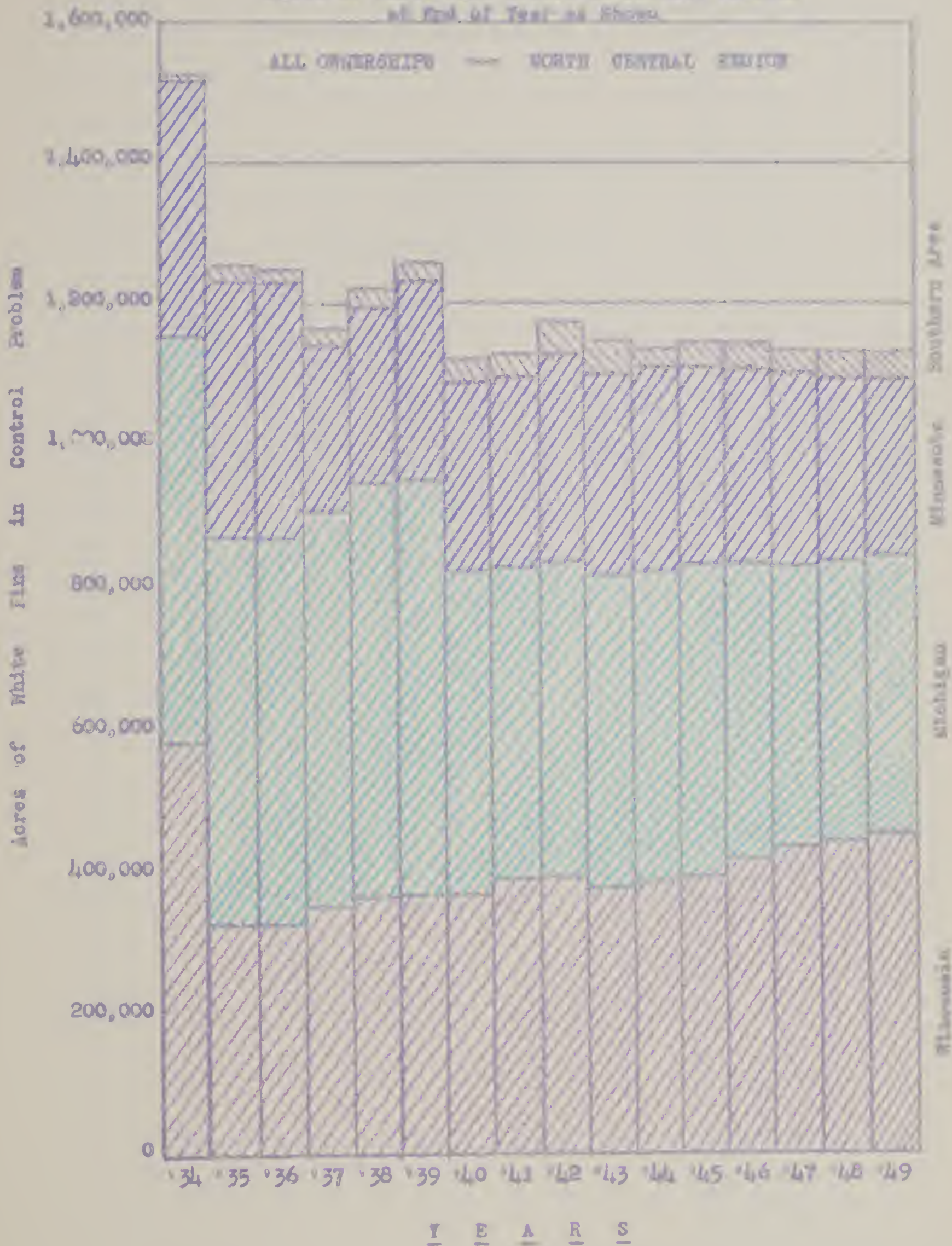
Acres shown in 1932 and 1933 were largely estimates, and were much too high. By 1934 some survey work had been done and additional observations resulted in throwing out over 1,300,000 acres, or nearly half of the acreage shown in 1933. Survey work done each year further reduced the white pine acreage. Since 1934 the total acreage has been roughly constant.

While the scale in Chart 3-A is necessarily too small clearly to express yearly changes in white pine acreage by states, it is apparent that since 1939 there has been a steady increase in acreage listed in Wisconsin and in the Southern Area. In Michigan a large acreage, consisting of planting sites and poorly stocked white pine, was thrown out in 1939. Since then, both in Michigan and Minnesota, there has been a gradual reduction in listed acreage.

Acres shown in the table are net figures. They are the results of applying additions and subtractions of acres found on current surveys to the status of control table of the previous year. The character of losses and gains are not shown. Since 1940 the total acreage of white pine has remained fairly constant, but the character and quality of the white pine has changed greatly.

To find out these changes an analysis of survey records by jobs was started in the Region in late fall of 1949. Tabulations were made of acres lost or gained for the following reasons:

Area of White Flaw Listed in Control Problem
at End of Year as Shown



C H A R T 3B

Changes in White Pine Acreage in Control Problem, MICHIGAN, 1939 to 1949

White Pine in 1939 521,060 Acres
White Pine in 1949 397,897 Acres



Acreage Discarded by 1949	
Insufficient Original Values	100,538 Acres
Cutting and Logging	39,348 "
Plantation Failures	16,800 "
Planting Sites Not Planted	12,056 "
Too Costly to Work	9,153 "
Damage by Blister Rust	3,956 "
Fire	3,839 "
Browse Damage	878 "

Acreage Retained 1949	
No Change	99,092 Acres
Better Stocking	169,329 "
Orig. Plant. Est.	66,022 "
Total Retained	334,443 Acres

Acreage Added Since 1939	
New Natural Reproduction	44,594 Acres
New Plantations	11,837 "
Better Survey Methods	7,023 "
Total Added	63,454 Acres

Thus, by 1949, of the 521,060 Acres listed in 1939, 19 percent remained unchanged; 45 percent was in better condition due principally to new natural reproduction; and 36 percent had been discarded. The 397,897 Acres listed in 1949 is made up of 25 percent mapped before 1939 and unchanged; 59 percent retained and improved; and 16 percent, largely new reproduction, added since 1939.

Decreases in Acreage

1. Poor pine values originally
2. Logging
3. Fire
4. Planting site not planted
5. Plantation failure
6. Blister rust damage
7. Too costly to work
8. Browse damage
9. Area too small

Increases in Acreage

1. New plantings
2. Natural reproduction
3. Inaccurate original survey

This analysis was not completed in time for the annual report except in Michigan and Minnesota. The data for Michigan is given because it is significant of changes in the problem in the three lake states.

Chart 3-3 is intended to show the changes in white pine acreage in Michigan in the last decade and the reasons for such changes. Between 1939 and 1949 there is a net reduction of about 123,000 acres, made up by discarding 186,000 acres and adding 63,000 acres. The 100,000 acres discarded because of insufficient original values should never have been included in the problem. Omitting these acres from consideration, it follows that during the 10-year period we lost 86,000 acres of white pine for reasons shown, and gained 63,000 acres largely of new natural reproduction.

The figures emphasize the large increase of natural white pine reproduction during the period. On 214,000 acres, or 54 percent, natural white pine reproduction 1 to 10 years of age has either increased in stocking older stands, or has made up new areas. It thus appears that while the acreage of white pine listed in 1949 is less than in 1939, there are many more white pine trees now than ten years ago.

Ownership of White Pine

The ownership status of white pine did not materially change in 1949 from previous years. Approximately 51 percent was in private ownership; 26 percent owned by states, counties and municipalities; 17 percent by U. S. Forest Service; and 6 percent administered by the U. S. Indian Service.

Checking

This activity, while a type of survey, is treated separately. Checking is the systematic evaluation of ribes eradication the same year the work is done to determine if acceptable ribes eradication work has been performed, or if the whole or certain portions of a given area need rework. If the check reveals portions of an area with ribes feet of live stem averaging substantially more than 25 feet of live stem per acre, those portions should be reworked.

The results of checking of ribes eradication work in 1949 are shown by states and ownership classes in Table 4. It will be noted that of the 87,083 acres worked and checked 99.5 percent showed less than 25 F.L.S. per acre after eradication. The average for all checking was 1.9 bushes and 3.5 F.L.S. per acre.

Local Control Accomplishment

A more detailed discussion of local control accomplishments is given in the sections devoted to the separate ownership classes, state and private lands, work Project BLR-3; National Forests, Project BLR-4; and Indian Reservations, Project BLR-7. The discussions following will pertain to the work as a whole.

Local Control in 1949

In Table 2, 2A, and 3, local control work performed in 1949 is shown classified by states and work agencies. For details of work done the reader is referred to these tables. Approximately 48 percent of the acreage covered was initial; 24 percent was second working, and 28 percent was third and other workings.

Work on Indian Service, Forest Service, and state lands is fairly on schedule, except on the Superior National Forest and certain other public lands in northeastern Minnesota, where rust is very active, ribes are abundant, and control costs are high. Work on private lands has fallen behind schedule, and thousands of acres of good white pine are being lost because of lack of funds to work such areas on time.

Local Control Procedure

The one-man system of ribes eradication started in 1948 was continued in parts of the Region in 1949. In Minnesota it was used exclusively on the Island Lake Memorial Forest, Paul Bunyan and Smoky Hills State Forests. Most of the work on the Chippewa National Forest, and part of the work on the Superior National Forest, and Red Lake Indian Reservation was also done by the one-man system. This system proved to be most effective where there was a large amount of slash on the ground. In working this type of area with a three- or four-man crew much time is lost by certain members waiting for others to struggle through slash piles. On the Chippewa National Forest ribes eradication was done on each district by two or three fire guards during times of low fire danger. This system, in which each man received training, was used effectively.

In Wisconsin the fundamental principle of the one-man system - working back and forth across a line - was used by two and sometimes three men. A drag line, as in the one-man system, marked individual strips. This system was successful.

Indians have not proven adaptable to this type of work. They still do best work in crews of four or five with a crew leader back of the line.

An effective method of scout work in ribes eradication was followed on the Manistee National Forest in Michigan. Here there are extensive stands of white pine planted on sandy soils under oak. Ribes are very scarce. To work such areas by crew to find all of the bushes would be uneconomical. The ordinary method of scouting by looking for favorable sites on strips one hundred to several hundred feet apart misses these scattered bushes. The plantations had been established in the 1930's, had had initial workings, and had been placed on maintenance. However, a few cankers were appearing. The system successfully used was for an experienced man to scout through a stand looking for cankers. When these were found he worked the environs carefully and usually found the causative ribes bushes. This method is especially adapted to inspection of areas on maintenance.

Practical Chemical Eradication

A limited amount of applied ribes eradication was done by the use of chemicals. In Wisconsin, Ribes americanum on approximately 21 acres were treated with aqueous foliage sprays of 2,4-D at a concentration of 1,000 ppm. The bushes were large and distributed in clumps in five separate areas. Spraying R. americanum has proved very effective. It not only gives complete kill if all bushes are thoroughly covered, but the plants can be destroyed at about one quarter the cost of uprooting them by hand. An estimated 44 man-days were used on the 21 acres. Similar work was done in Ohio. The City of Swanton supplied men and 2,4-D to treat large patches of R. americanum in the vicinity of its watershed plantations. Similar aqueous foliage sprays of 2,4-D were also used to destroy large concentrations of R. americanum on the Toledo Metropolitan Park Area.

Large R. cynosbati bushes on an area near Bedford, Indiana, were treated early in the spring with an aqueous foliage spray of 2,4,5-T at 6,000 ppm. At the same time others were sprayed basally using 24,000 ppm ester of 2,4,5-T in oil. Later observations indicated that both applications were quite successful in killing the plants. The same treatments were applied to large R. missouriense bushes at the Crystal Springs Fish Hatchery in southeastern Minnesota. The work was done in mid-season and degree of kill will not be known until next spring.

Toward the end of the eradication season, large R. cynosbati bushes growing in rocky soil were treated basally with a solution of 24,000 ppm 2,4,5-T in oil. This was on a privately-owned pine area in Upper Michigan. The rock-bound plants were too numerous and difficult to destroy by uprooting. If the chemical treatment proves successful on the two acres treated the owner plans to complete the work to protect his pine.

Status of Control

The present status of control by States and ownership classes is given in Tables 6 and 7 and graphically in Charts 1 and 2. As of December 31, 1949, the status of control by States including all ownerships is shown in the following table:

State	Acres of Control Area	Percent Control Area	
		Initially Worked	On Maintenance
Illinois	13,397	83.4	17.0
Indiana	189,710	41.8	30.8
Iowa	50,066	68.5	37.7
Ohio	456,005	39.2	18.6
Michigan	1,185,435	90.5	38.0
Minnesota	559,611	66.5	20.1
Wisconsin	1,456,264	83.0	37.7
Region Total	3,910,488	75.6	32.6

There was an increase of 3 percent in the acreage placed on maintenance in 1949 over that at the end of 1948. Post-checks made in 1949 were chiefly responsible.

Status of Control by Ownership Classes

North Central Region on December 31, 1949

Ownership Class	Acres of Control Area	Percent Control Area	
		Initially Worked	On Maintenance
Forest Service	375,727	75.1	45.5
Indian Service	129,264	94.5	59.3
National Park Service	120	100.0	0.0
Non-Fed. Public	772,985	90.5	41.8
Private	2,632,392	70.4	26.9
Region Total	3,910,488	75.6	32.6

It is apparent from the table above that excluding Isle Royale with acreage too small to be significant, best progress towards the goal of accomplishing control has been made on Indian Service lands, with 94.5 percent initially worked and 59.3 percent on maintenance. In fact quite satisfactory progress has been made to date in protecting publicly owned white pine. Our big problem remains of protecting privately owned white pine. Of this privately-owned white pine practically 30 percent has not been initially worked and 73 percent needs further work before it can be placed on maintenance.

The protection of young white pine regardless of ownership against blister rust is a public responsibility. The private owner of such white pine will usually not live long enough to reap the benefits in mature timber of young stands he has protected against the rust. Furthermore he is usually unable to stand such costs. Young timber is a future national resource regardless of ownership. A public agency has to take the responsibility of preserving such potential national resources. We cannot expect private agencies or individuals to take this responsibility. Until this principle is recognized and acted upon we will continue to lose privately owned young white pine stands to the rust.

As blister rust control workers we must look further than saving existing white pine crops. The presence of ribes on good white pine sites destroys not only the existing stands but prevents indefinitely the growing of future white pine forests.

Value of Blister Rust Control

The problem of expressing the values saved by blister rust control is made difficult by the many intangibles to be considered. Since the rust primarily damages young stands, future yields and stumpage values must be estimated. The rotation and rate of growth are important. Abundance of ribes, weather conditions and prevalence and rate of spread of the rust in different parts of the region must be considered. There is danger that in trying to evaluate all of these factors the process may become too complicated to be useful. Since estimates have to be used any way, the simplest approach may be best.

Values should be expressed in terms of the white pine crop, in stumpage, rather than in acres. For purposes of estimates certain basic assumptions have to be made. After consulting with foresters and others we have used a rotation of 60 years in Illinois, Indiana, and Ohio; 80 years in Iowa; and 120 years in Michigan, Wisconsin and Minnesota. We have used a stumpage yield per acre at maturity of 35 M board feet in Illinois, Indiana and Ohio; 20 M in Iowa; and 12 M in Michigan, Wisconsin and Minnesota. Higher yields were used in the Southern Area because white pine there is mostly in plantations and thus fully stocked. Expected yields in these states of 50 M and 60 M board feet per acre are not uncommon. Average yields in the three Lake States are lower because of the many acres of natural white pine not fully stocked. We are using a stumpage of \$25 per M board feet throughout the region. This is lower than the present average, and there is no reason to believe future stumpage will materially decrease. Foresters have criticized all of these average assumed values as being too conservative.

In expressing values of white pine in relation to blister rust control we submit the following estimates: (1) Values if no blister rust were present; (2) values if no control work had ever been done; (3) values saved by blister rust to date; and, (4) values lost if control work is not continued. We are using expectation values without discounting them to the present.

White Pine Values if Blister Rust Were Not Present

Based on assumed average per acre yields as given, it is calculated there are on the 1,132,200 acres of white pine in the regional control problem, 14,380,000 M board feet of present and expected stumpage yields. At \$25 per M board feet this amounts to \$359,500,000. Added to these figures there are perhaps an additional 500,000 acres of scattered white pine outside the control problem. At 3 M board feet per acre this amounts to 1,500,000 M board feet, or \$37,500,000. Besides this there may have been a loss to blister rust of 620,000 M board feet valued at \$15,500,000 potentially. Thus there is a total of 16,500,000 M board feet of present and expected stumpage valued at \$412,500,000 theoretically possible from present stands of white pine if blister rust had not been present and other things had been equal.

Values If No Control Work Had Been or Would Be Done

Based on a careful appraisal by states and age classes of white pine, it is estimated that for the region as a whole, if no control work had been or would be done, we would lose 16 percent of our poles and mature trees, and 80 percent of saplings and reproduction. The smaller loss in larger trees takes into consideration salvage values after trees are infected. We estimate that 20 percent of saplings and poles would survive to maturity due to their growing on areas naturally free from ribes or nearly so. We calculate an over-all loss of 60 percent of trees in this region to blister rust without any control work. This would amount to a potential 8,630,000 M board feet with a stumpage value at maturity of \$215,750,000 of which 8,227,000 M board feet valued at \$205,680,000 at maturity is within our control area. If we add the 620,000 M board feet with a mature stumpage value of \$15,500,000 estimated to be already lost, there is a total of 7,250,000 M board feet at maturity with a future value of \$231,250,000 which might have been lost if no control work were done.

Values Saved by Blister Rust Control to Date

Previously we have calculated that 60 percent of the white pine within our control area has been or would be lost to the rust if no control work had been or would be done. However, by control work to the end of 1949 we have placed 36.6 percent of the pine on maintenance and 48.0 has been given initial working but is not on maintenance. We estimate 100 percent saving of white pine on maintenance and 80 percent saving of areas worked once. Applying these percentages to figures showing total loss without control we have saved by blister rust control to date:

6,143,000 M board feet of future stumpage valued at
\$153,565,000 at maturity.

White Pine Values Lost if Control Work is Discontinued

We have made a good start in blister rust control in this region. However, much remains to be done. There is still 15 percent of the acreage within the control area unworked, and 48 percent worked initially but needing additional workings before it can be placed on maintenance. We calculate that unless an adequate control program is continued, we stand to lose a potential stumpage of 2,085,000 M board feet with a value at maturity of \$52,116,000.

Summary

Considering only white pine within our present regional control area, if blister rust had been unchecked, we calculate we would lose expectation values of 3,227,000 M board feet of stumpage, valued at \$205,680,000 at maturity. Control work to date has saved of these expectation values 6,143,000 M board feet of future stumpage valued at \$153,565,000 at maturity. There still remains to be saved by future control work expectation values of 2,085,000 M board feet of future stumpage, with a mature value of \$52,116,000.

The table following shows these calculations by states:

Summary of Calculated Expectation Values of White Pine in the North Central Control Problem.

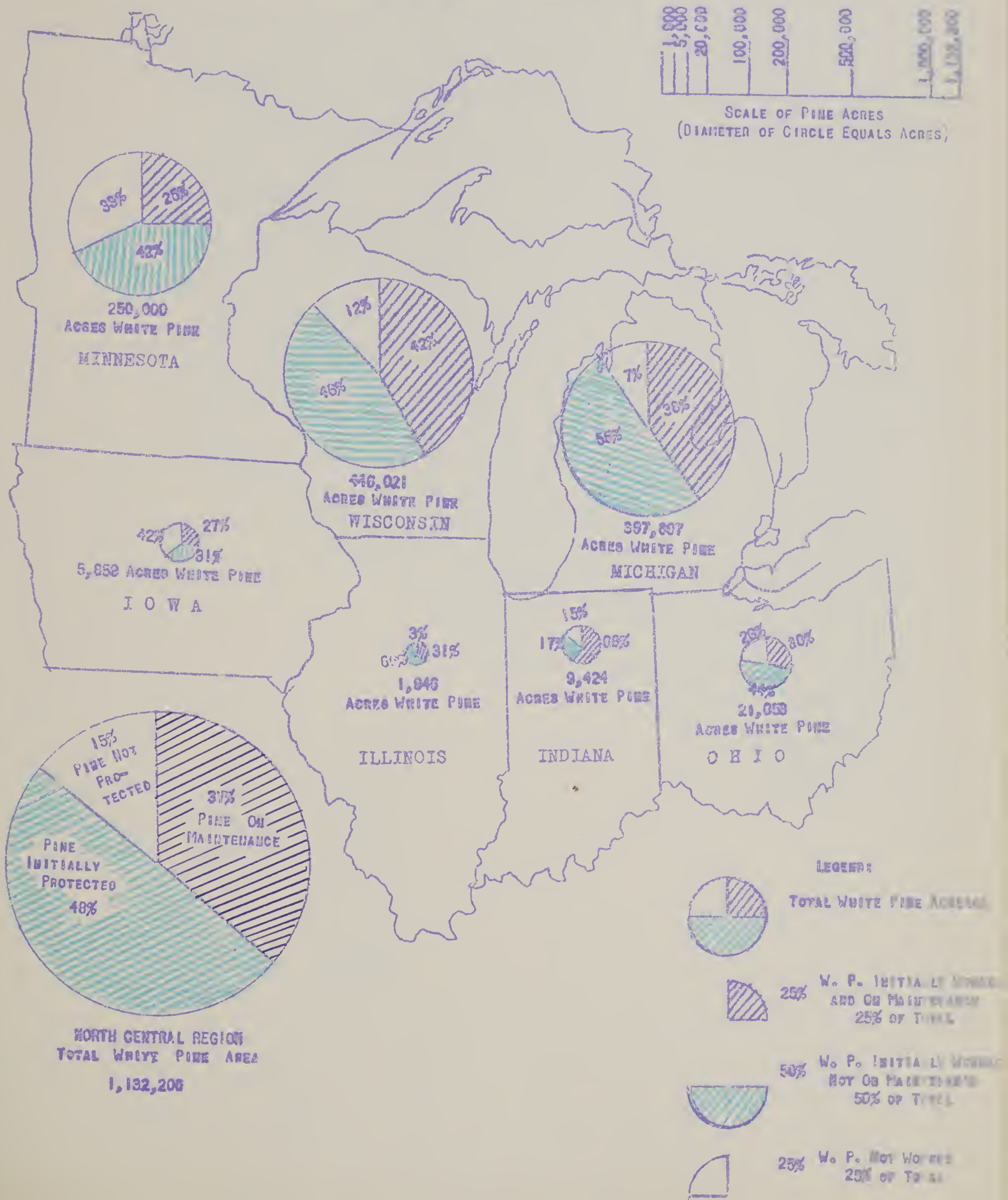
(1) Lost if No Control Work Had Been Done; (2) Saved by Control Work to December 31, 1949; and

(3) Lost if Control Work is Not Continued.

State	W.P. Values Which Would Have Been Lost Without Control			W.P. Values Otherwise Lost, Saved by Control to End of 1949			W.P. Values Lost if No Further Control Work is Done		
	Equivalent Acres	Stumpage at Maturity M. Bd.Ft.	Value	Equivalent Acres	Stumpage at Maturity M. Bd.Ft.	Value	Equivalent Acres	Stumpage at Maturity M. Bd.Ft.	Value
Illinois	535	16,725	\$ 468,125	449	15,715	\$ 392,875	86	3,010	\$ 75,250
Indiana	1,772	62,020	1,550,500	1,453	50,855	1,271,375	319	11,165	279,125
Iowa	1,515	30,300	757,500	788	15,760	394,000	727	14,540	363,500
Ohio	3,884	135,940	3,398,500	2,525	88,375	2,209,375	1,359	47,565	1,189,125
Michigan	194,360	2,332,320	58,308,000	159,375	1,912,500	47,812,500	34,985	419,820	10,495,500
Minnesota	167,690	2,012,280	50,307,000	98,937	1,187,244	29,681,100	68,753	825,036	20,625,900
Wisconsin	302,970	3,635,610	90,891,000	239,346	2,872,152	71,803,800	63,624	763,488	19,087,200
Region	672,726	8,227,225	\$208,680,625	502,873	6,142,601	153,565,025	169,853	2,084,624	52,115,600
Total									

CHART 4

Status of Blister Rust Control Work, All Ownerships,
In NORTH CENTRAL REGION - 1949 - Acres of White Pine
(Based on Tables 6 and 7)

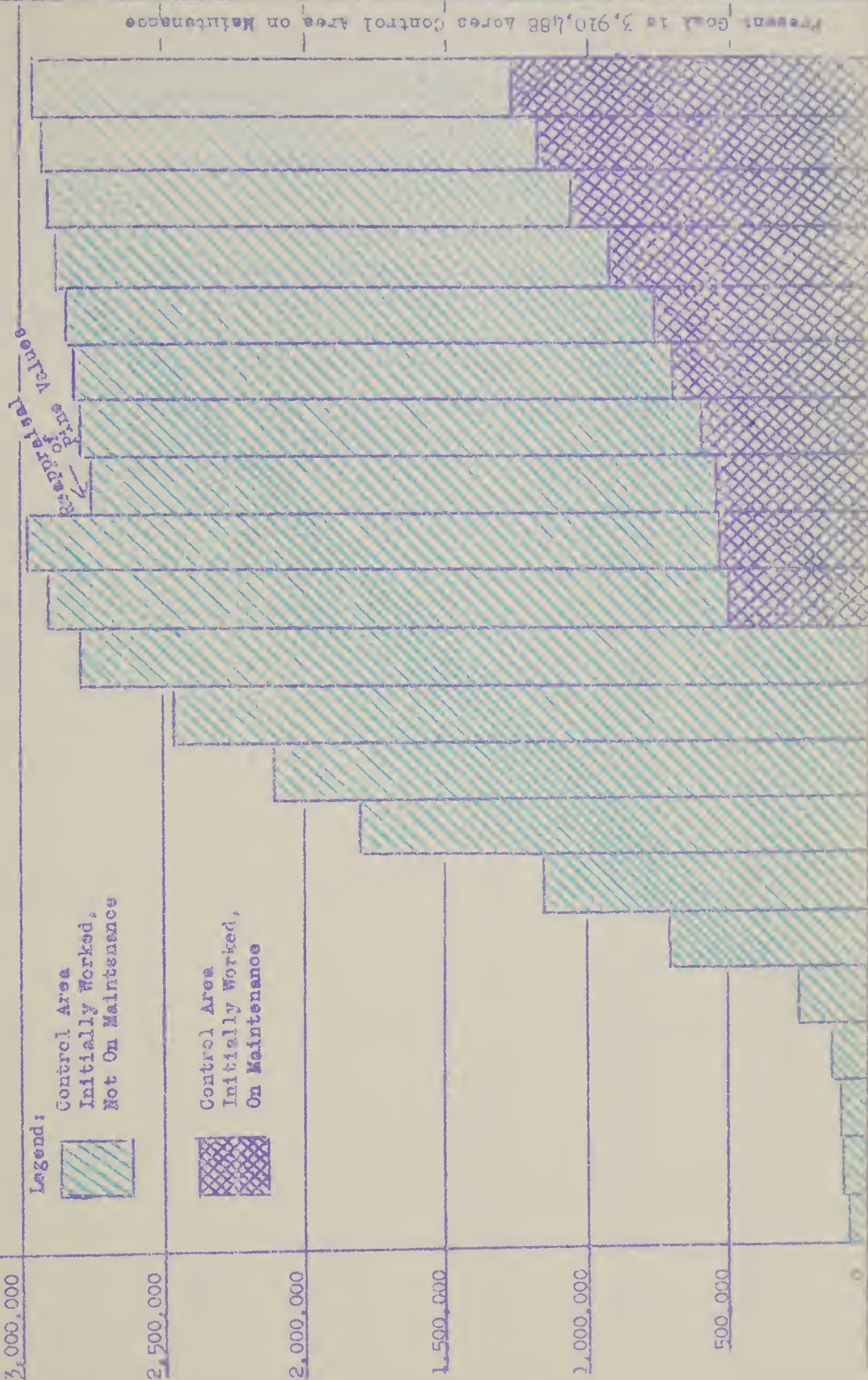
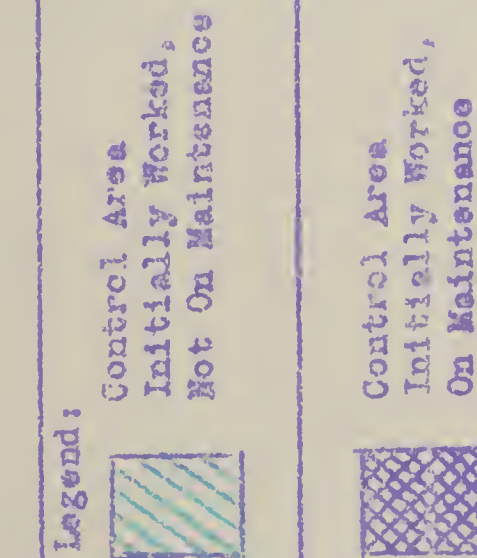


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STATUS OF CONTROL AT END OF EACH YEAR AS SHOWN, ALL OWNERSHIPS

NORTH CENTRAL REGION

Not Known



Present: Govt. to 3,910,488 Acres Control Area on Kalimantan

ACRES IN CONTROL AREA

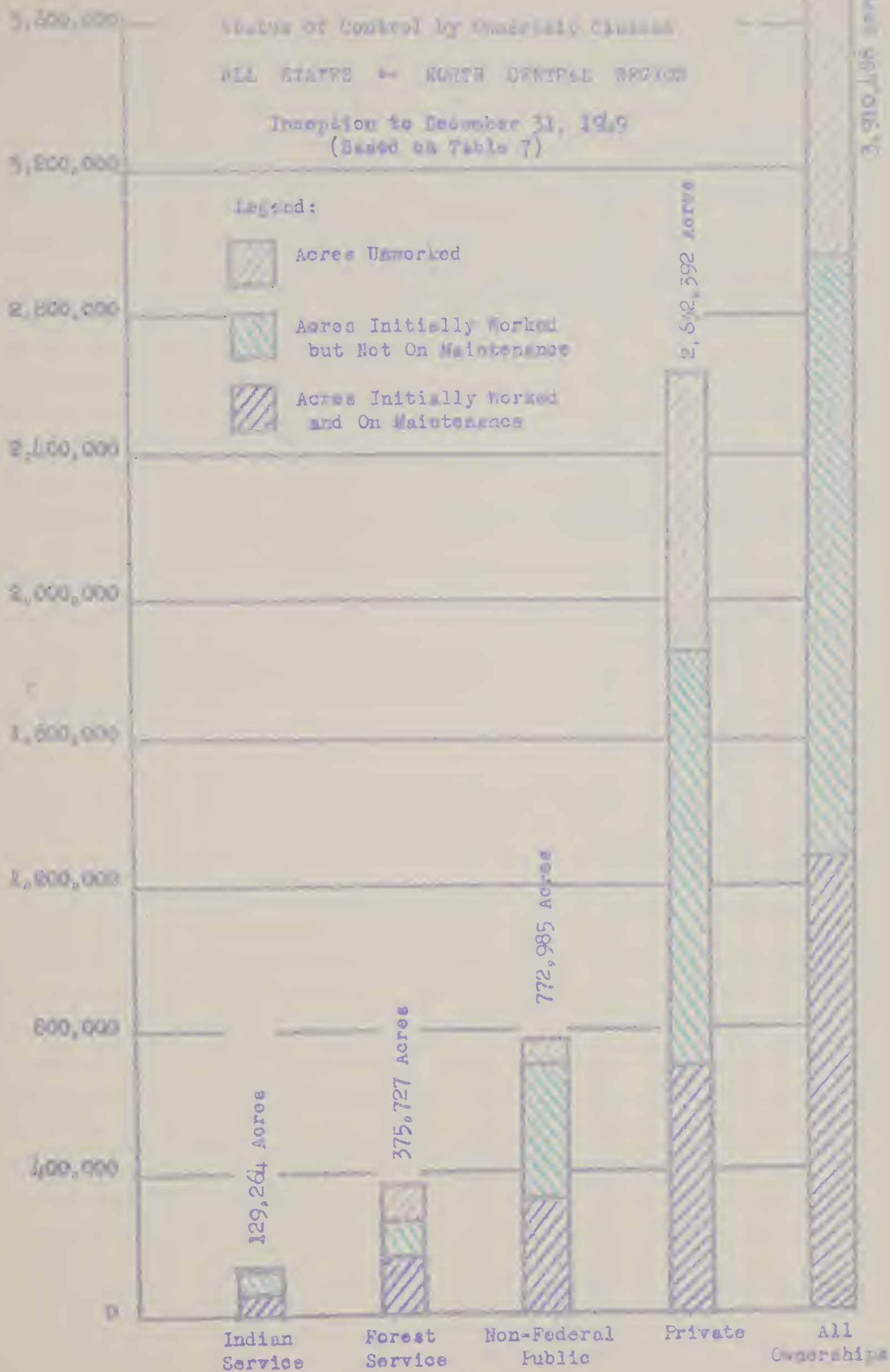


CHART 7

Ribes Destroyed per Acre by States and Ownership Classes, All Workings, Inception to December 31, 1949

NORTH CENTRAL REGION (Based on Table 8)

Forest Service Ownership

Indian Service Ownership

Non-Federal Public Ownership

Private Ownership

All Ownership

200

150

100

50

0

Ribes Bushes Destroyed Per Acre

175.5 Ribes

124.0 Ribes

91.2 Ribes

62.0 Ribes

55.0 Ribes

40.3 Ribes

12.6 Ribes

4.6 Ribes

48.9 Ribes

45.1 Ribes

49.6 Ribes

54.5 Ribes

Indiana

Ohio

Michigan

Wisconsin

Illinois

Iowa

Minnesota

Forest Service

Non-Fed. Public

Private

All Ownership

Cumulative Local Control

In Table 8, total eradication work by workings, States, and ownership classes are shown from the time work started to and including 1949. Acreages for initial working in Table 8 are gross and will differ from net initially worked acreages in Tables 6 and 7. In the latter tables, if an area after initial working was burned over and pine values destroyed, acres initially worked were removed from the status table. Such acres are retained, however, in Table 8, because it is a statement of work done.

It may be noted in Table 8 that 3,445,224 acres have been worked initially; 1,049,936 acres, or 30 percent worked twice; and 225,493 acres, or 7 percent worked more than twice.

In Table 8, ribes destroyed per acre are shown. Since this is a cumulative table with large acreage and ribes figures, the per acre figure should be fairly representative of ribes abundance in the State or ownership class concerned. In Chart 3, the average number of ribes destroyed per acre in "All Workings" is used, in order to obtain as large a base as possible.

In order of increasing abundance of ribes, starting with the smallest number per acre, the States line up as: Indiana, Ohio, Michigan, Wisconsin, Illinois, Iowa, Minnesota. Iowa is second high primarily because much of the acreage in control zones around shelterbelts consisting only of cultivated fields, was not counted. This reduced the number of acres to apply against the number of ribes pulled. The average number of ribes per acre in Minnesota, 124.0 is over one third again larger than its nearest competitor, Iowa, with 91.2 ribes per acre.

On the basis of ownership classes, ribes destroyed per acre were much more abundant on Indian Reservations, 175.5 per acre, than on National Forests, 48.9 per acre, or on private lands, 49.6 per acre, or on non-federal public lands, 45.1 per acre.

In Table 8A a summary of ribes eradication, all workings, from inception through 1949 is given by States, ownership classes, and operating agencies. The chief value of Table 8A is to show the operating agencies which have performed ribes eradication on lands under varying ownerships. Thus, on lands under Forest Service ownership, Bureau funds have been used to eradicate ribes from 130,738 of the total 510,019 acres worked. On the other hand Forest Service funds have been used to work 845 acres out of 2,794,428 acres of private lands worked. It is economically sound for land of all ownerships to be covered for ribes within the working radius of a crew of trained men. The working of Forest Service pine by Bureau crews, and of State and private white pine by Forest Service crews can thus be balanced off, one against the other.

Nursery Sanitation

Work Done 1949

There were six nurseries given sanitation workings during 1949. One was federal, three were state, and two were privately owned. There were 20,595 ribes removed from 2,855 acres of control area at a cost of 132 man-days. This work provided protection for approximately 12,325,000 white pine trees. In protecting nurseries against blister rust, the full 1500-foot protection zone for all ribes and one-mile wide zone for cultivated black currants are maintained. The reason for this additional protection width is because nursery stock is often grown under overhead watering systems which create more or less optimum infection conditions. In order to maintain ribes-free conditions and to insure so far as possible the production of rust-free white pine planting stock, periodic workings of white pine growing nurseries are performed at least every two years. At the present time, practically all of our white pine producing nurseries, except a few private nurseries, have been protected, and the problem involves chiefly the maintenance of this protection work. Nursery sanitation performed in 1949 is shown in Table 9.

Present Status of Nursery Sanitation

The following table, taken from Omnibus Table E, shows the present status and cumulative work done, 1918 to 1949 in nursery sanitation in this Region:

State	Number Nurseries Worked			Total Acres Worked	Total Ribes Destroyed	Total Man-days Used
	Protective Zones					
	Retained	Dropped	Total			
Illinois	4	4	8	2,520	50,401	380
Indiana	2	4	6	3,750	11,351	60
Iowa	7	2	9	3,436	67,106	824
Ohio	7	9	16	7,021	60,645	1,912
Michigan	7	6	13	4,786	1,123,163	16,371
Minnesota	6	11	17	6,308	1,335,438	5,091
Wisconsin	9	8	17	5,140	887,938	8,488
Region Total	42	44	86	32,961	3,536,042	33,126

The usual reasons for not maintaining nursery sanitation zones around white pine producing nurseries are that such nurseries discontinued the growing of white pine, or the prevalence of ribes made the sanitation work too costly to maintain.

Control Area Permits

As defined in Federal Quarantine 63, the States of Michigan, Minnesota, Ohio and Wisconsin are White Pine Control Area States. The interstate movement of ribes into designated control areas within these States can only be done if each ribes shipment carries a control area permit issued by the proper State Plant Quarantine Officer. The issuing of control area permits is a function of the State which has been carried on for several years. Previous to 1943, however, no record on this activity has been made in our Annual Reports. A description of the procedure in issuing control area permits is given in the 1943 Annual Report, and will not be repeated here.

As noted in Table 5, during 1949, out of 626 applications for ribes shipping permits, 87.9 percent were approved. The large majority of the shipments were made in the spring.

Violations of Federal Quarantine 63

As reported by the Division of Domestic Plant Quarantine, during the Fiscal Year 1949, there were only five violations of Federal Quarantine 63, four intercepted at Chicago and one at St. Paul, as ribes shipped without permits, four shipments to Michigan and one to Minnesota. By comparison there were two violations reported going to the states of this region in 1948. For the whole United States, there were 14 violations of Federal Quarantine 63 in Fiscal Year 1949, compared with 9 in Fiscal Year 1948, and 33 in Fiscal Year 1947.

Cultivated Black Currant Elimination

The only work under this heading in 1949 was the finding of 7 bushes in 4 plantings, and the destruction of 18 cultivated black currant plants in 8 plantings. To the end of 1949 in the Region, 288,758 cultivated black currant bushes in 34,797 plantings had been destroyed. There remain 982 known plantings with 6,607 cultivated black currant bushes not yet destroyed. Thus, 97.8 percent of all known bushes have been eliminated.

Canker Pruning

A limited amount of canker pruning in protected areas was performed in four states, as noted in Table 14. In 1949, there were 3,787 cankers removed from 2,676 infected trees. To date, 176,602 cankers have been removed from 82,630 trees, and 3,630 infected trees have been cut down, chiefly in Minnesota, Michigan and Iowa. It is believed that when adequate labor is again available, canker pruning on selected crop trees in a protected stand can be economically justified, as a control measure.

Informational Activities

Information about blister rust and its control was carried to the cooperating agencies and to the general public through the media of Fair Exhibits, displays, a few radio talks, newspaper articles, addresses at meetings, correspondence, bulletins, reports, and by direct personal contact. As an increasing amount of effort is being directed toward the securing of private cooperation, more direct contacts by the Leaders and Field Supervisors with private pine owners are being made with good results.

Two new blister rust films, made available in 1948, "Blister Rust - Enemy of White Pines" and "Paul Bunyan Had a Son", were used extensively in 1949. The picture, "Paul Bunyan Had a Son" was filmed in the North Central Region and is particularly in demand in this Region because of its local color. By the end of the year so much interest had been generated by it that the number of available copies of this film was insufficient to fill the demand for showings at schools, 4-H Clubs, Conservation groups, Service Clubs, etc. During 1949 "Paul Bunyan Had a Son" was shown 201 times to 29,000 people and "Blister Rust - Enemy of White Pines" 94 times to 22,000 people. About half of the audiences were students and half the general public.

Chemical Eradication of Ribes

Investigations of 2,4-Dichlorophenoxyacetic acid (2,4-D) and 2,4,5-Trichlorophenoxyacetic acid (2,4,5-T) compounds as herbicides were continued. In addition to checking ribes plots treated in previous years, new plots were also established in 1949. These new plots were based on some of the more successful aspects observed in the earlier plots. Efforts were also made to put into practical use those features of chemical treatment of ribes that appeared to have good possibilities in the field.

In checking ribes plots that were treated one year or more earlier it was definitely proven that Ribes americanum and R. hudsonianum can be readily killed with comparatively weak solutions of aqueous 2,4-D sprays. Since the wild black currant is one of the species that is difficult to eradicate by hand because of its profuse sprouting and abundance, it is definitely more economical and feasible to treat it with chemicals. Concentrations of 1,000 parts per million of 2,4-D applied as aqueous foliage sprays anytime during the growing season, successfully kills this species. Either the sodium salt or the ester may be used. The former, which comes in powder form, is used at the rate of 1 ounce (avoirdupois) in 3 gallons of water to give 1,000 p.p.m. The ester comes in liquid form and 1 fluid ounce in 3 gallons of water also gives a concentration of 1,000 p.p.m. This solution was applied to R. americanum in several areas in various states of the Region and excellent results were obtained. A saving of from 20 to 80 percent in labor is realized by treating this species with chemicals rather than pulling them by hand and a more complete kill is achieved.

Where R. americanum and other ribes species that are not as readily killed by chemicals grew on the same area a combination of chemical treatment and hand eradication was used on several areas. Part of the eradication crew was equipped with back-pack pumps and treated the black currants while the rest of the crew used ribes hooks for uprooting the bushes that were more resistant to the chemicals. This proved to be a labor saving method especially where R. americanum grew in well defined clumps.

Concentrations of 1,000 p.p.m. 2,4,5-T are equally effective in killing black currants but as this material is more expensive than 2,4-D there is no point in using it for this purpose.

The use of 2,4-D, however, is definitely limited to the treatment of R. americanum and R. hudsonianum in this Region. It has not proved effective on the various other species of ribes that occur here.

Experiments indicate that 2,4,5-T is more effective on the other ribes species. Seemingly good results have been attained by applying aqueous foliage sprays of 2,4,5-T at concentrations of 6,000 p.p.m. early in the growing season. Two fluid ounces of 40% ester of 2,4,5-T to one gallon of water were used. Sprays were applied to R. hirtellum, R. cynosbati, R. missouriense, R. lacustre, R. triste and R. glandulosum. When applied from the time the bushes first came into leaf until late June a fairly satisfactory degree of kill was obtained. After July 1, when growth had hardened, there was an appreciable amount of sprouting from the crowns. Some sprouting was noted on plants that had been treated before the middle of the season but not in sufficient amounts to rule out the possibility of treating the plants with 2,4,5-T on a practical basis. The economy of treating certain areas chemically even if they must be gone over twice is such as to be preferable over pulling the plants by hand. This is especially true in areas having such hard-to-pull ribes as R. hirtellum in sod or large patches of R. triste whose roots are entwined with other growth. It is also more economical to spray carpets of seedlings. Searching time is a very important factor in determining whether it is more practical to spray twice than to uproot once. Where hard-to-pull ribes occur in considerable numbers and are fairly easy to find, spraying is definitely more economical than pulling by hand, even if the area must be gone over a second time.

A certain amount of practical spraying of such areas was done in 1949. Preliminary checks indicate that the treatments were fairly satisfactory where properly done. Much of the effectiveness depends upon complete coverage of the plants. Careless application, like improper pulling, results in high survival. Very good results were observed in an area in Indiana where large clumps of R. cynosbati were sprayed early in spring. Fairly good kill was noted in Minnesota where large clumps of R. missouriense were treated at the Crystal Springs Fish Hatchery. Some survival was noted, however, where the crew apparently did not cover all parts of the bushes.

The experimental plots treated in 1949, bore out the earlier observation that such species as R. hirtellum, R. glandulosum and R. triste can be killed in most cases, using an aqueous foliage spray of 2,4,5-T at a concentration of 6,000 p.p.m. if applied before July 1. There were exceptions; some individual plants seemed to be resistant and others produced sprouts. At present, therefore, it can not be stated unequivocally that 2,4,5-T will give complete kill.

Combinations of equal parts of 2,4-D and 2,4,5-T were tried but proved no more effective than 2,4,5-T alone.

Detergents, such as "Dreft" and "Nytrol", were added to some of the aqueous spray solutions but there appeared to be no appreciable difference in effectiveness in killing the plants. Since our own experiments were conducted we have been advised that the addition of a small quantity of summer spray oil emulsion will improve the effectiveness of aqueous solutions. The addition of this oil emulsion is said to aid in thorough and rapid wetting of foliage and stems, to facilitate penetration of waxy plant tissue, to improve "creeping" and subsequent covering of protected and concealed growing points, and to serve as a temporary marker. We plan to use some of this summer spray oil emulsion in our 1950 applications.

The foregoing has dealt with aqueous foliage sprays only. We have found that oil solutions applied as foliage sprays are not as satisfactory as water solutions because of subsequent sprouting.

There is, however, a definite use for oil solutions, using either fuel oil or kerosene as the diluent. This is in the basal stem treatment of ribes. Very encouraging results have been achieved by treating the basal stems of upright growing ribes with small amounts of an oil solution consisting of 24,000 p.p.m. 2,4,5-T in kerosene or fuel oil. Ribes, of upright form, such as the several species of gooseberries and R. americanum and R. lacustre can readily be treated by this method. A small pressure sprayer is used to apply the solution to the basal stems from the ground line to a height of about 12 to 18 inches. The spray is directed from two opposite directions to insure complete coverage of the stems. Only enough solution is applied to wet the lower stems and crown. Thus, even though four times as much of the ester of 2,4,5-T is needed to make a concentration of 24,000 p.p.m., it is still more economical both in time and chemical than foliage sprays where the entire plant must be sprayed. It has been found that this basal stem treatment is effective from early spring to fairly late in the fall. It kills the plants with a minimum of sprouting. Because less dosage is required per plant the application is faster and smaller sprayers can be used. Pressure sprayers of one quart to one gallon capacity are sufficient and their portability facilitates speed of operation. The basal stem application is most adaptable for the treatment of upright growing bushes which grow singly in pastures or on rocky ground. It is impractical for treating low-growing species of ribes or those growing in many-stemmed patches where it would be difficult to hit the numerous stems arising from indistinct crowns.

Chemical treatment of ribes has a definite place in the blister rust control program. If we recognize its limitations and apply it only in situations where its effectiveness has been proved, good results will be obtained. For the time being, it has not been developed to the point where it can replace eradication of ribes by hand. However, since their introduction a few years ago, the hormone type of chemical weed killers have constantly been improved. Each year more is learned about effective combinations, concentrations, dosages, time of application and methods of application.

While chemical eradication may not entirely take the place of destroying ribes by hand in the North Central Region, it seems reasonable to presume that it will play an increasingly important part in reducing their numbers.

Costs

Cost figures for the Region during 1949 are shown in Tables 12 to 12C, for Milwaukee alone; by States and appropriations; by States and Activities; and by Activities and Appropriations.

A total of \$382,055.07 was spent during the calendar year, with the following percentage distribution by sources:

State Indirect Aid	\$ 14,404.00	3.8 percent
State Direct Aid	69,099.30	18.1 "
Bureau 71 and W-a.14	97,602.39	25.5 "
Bureau 73 and W-e.14	40,935.85	10.7 "
Forest Service	91,619.34	24.0 "
Indian Service and Tribal	68,393.69	17.9 "
Total	\$382,055.07	100.0 percent

It is interesting to note that the states contributed in 1949 over \$28,000 more in Direct Aid than the Federal Government towards the cooperative control program. Direct Aid in 1949 was over \$13,000 larger than in 1948. In 1949 the cooperative control dollar was made up of 63 cents from the states and 37 cents from the Federal Government.

COOPERATIVE BLISTER RUST CONTROL ON STATE AND PRIVATE LANDS IN THE
NORTH CENTRAL REGION, 1949, WORK PROJECT BLR-3-3

Objective of Cooperative Project

The purpose of this cooperative project is to control white pine blister rust on all non-federal lands, both public and private. Non-Federal Public and Private funds are matched by Regular Federal Funds in so far as appropriations are available. These funds are administered cooperatively by the Bureau of Entomology and Plant Quarantine and State agencies concerned and are spent for control on state and private lands.

Cooperative Expenditures in 1949

During 1949, as noted in Text Table 4, \$69,099.30 were spent as Direct Aid by state and private cooperators, including states, counties, municipalities and individuals, on the protection of state and privately-owned white pine against blister rust. Matching these funds the Bureau of Entomology and Plant Quarantine spent a total of \$40,935.85 of 73 and W-e.14 funds. Thus, a total of \$110,035.15 was spent on local control on state and private lands in this Region with the states contributing 63 percent and the Federal Government 37 percent of the total. For the past 4 years state direct aid has been steadily increasing each year. During 1948 and 1949 state contributions have exceeded federal contributions towards the cooperative control program.

Control Accomplishments, 1949

In Text Table 1, local control accomplished on Regular-Cooperative funds on state and private lands is shown. It will be noted that under all workings 22,503 acres of white pine were given protection by the removal of 630,344 ribes from 80,765 acres of control area at a cost of 4,821 man-days.

Compared to recent previous years this represents a falling behind of the control schedule for the protection of state and privately-owned pine. Although state and private agencies increased their cooperative contribution toward the work the increase was not sufficient to offset the drastic cut in federal funds for work on lands of this class of ownership which was made beginning July 1, 1947.

The Bureau of Entomology and Plant Quarantine used its funds primarily for labor. State and Cooperative funds were used in the employment of labor, supervisors, the assignment of state and county men to control work, the employment of owners of white pines, etc. To a greater or lesser degree, owners contributed toward the protection of their own stands in all of the states.

Effect of Reduction in Funds on Cooperative Program

During the Calendar Year 1946 a reasonably adequate program of control on state and private lands was carried out, in general accord with the 5 Year Program. This program had for its purpose the completion of initial work and bringing up-to-date all necessary rework on state and private lands. Funds available for this work in 1947, 1948 and 1949 fell far short of what was needed to live up to this program and to prevent heavy losses of white pine to the rust.

During 1946 we removed ribs from 241,419 acres of control area to protect 77,849 acres of white pine on state and private lands. If work had continued on the 1946 scale in 1947, 1948 and 1949 we would have worked by now approximately 965,700 acres to protect 311,400 acres of white pine during the four year period. Because of reduced funds since 1946 we actually worked 533,476 acres and protected 162,516 acres of white pine in state and private ownership. Thus there were 432,224 acres of control area and 148,884 acres of white pine which were not worked, and which presumably would have been worked if funds had remained at the 1946 level. With rust abundantly present in the region this can only mean that valuable white pine resources are being lost to the rust, due to inability to work them in time.

Status of Control

In order that a complete record may be available for all work done under the Regular-Cooperative Program, Text Table 2 has been devised to show all work since inception in 1942 through 1949.

The status of control on state and private lands in this Region as of December 31, 1949 is shown in Text Table 3 and graphically in Chart 8. This total control problem includes 3,405,377 acres, approximately four-fifths of which is around privately-owned white pine.

Of the total control area, 75 percent has been initially worked, and 30 percent is on maintenance. Thus, while progress has been made in the protection of state and privately-owned white pine, there remains a great amount of work to be done before all control work is accomplished, and such stands are in a state of maintenance. The program on non-federal public lands, with 90 percent initially worked and 42 percent on maintenance, is much further advanced than that on privately-owned lands with only 70 percent initially worked and 27 percent on maintenance.

Text Table 1. Summary of Local Control on State and Private Lands,
North Central Region, 1949, Bureau-State Funds, B.L.R.3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
Initial Working							
Illinois	Private	-	8	8	26	5,541	3
Indiana	Non-Fed. Public	-	90	90	150	-	1
	Private	-	432	432	1,984	2,900	31
	Total	-	522	522	2,134	2,900	32
Iowa	Non-Fed. Public	-	7	7	25	6,161	23
	Private	-	6	6	45	6,253	23
	Total	-	13	13	70	12,414	46
Ohio	Non-Fed. Public	-	311	311	1,325	22,002	78
	Private	-	650	650	2,168	1,029	21
	Total	-	961	961	3,493	23,031	99
Michigan	Non-Fed. Public	695	221	916	1,937	19,091	77
	Private	1,085	443	1,528	9,216	23,044	170
	Total	1,780	664	2,444	11,153	42,135	247
Minnesota	Non-Fed. Public	40	-	40	40	46	17
	Private	53	55	108	292	27,002	136
	Total	93	55	148	332	27,048	153
Wisconsin	Non-Fed. Public	885	109	994	1,753	50,253	401
	Private	4,960	495	5,455	28,421	33,298	315
	Total	5,845	604	6,449	30,174	83,551	716
Region	Non-Fed. Public	1,620	738	2,358	5,230	97,553	597
	Private	6,098	2,089	8,187	42,152	99,067	704
Region Total, Initial		7,718	2,827	10,545	47,382	196,620	1,301

Text Table 1. (Cont'd.) Summary of Local Control on State and Private Lands, North Central Region, 1949, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine			Acres Worked	Ribes Destroyed	Man- Days Used
		Protected		Total			
		Natural	Planted				
<u>Second Working</u>							
Illinois	Private	-	5	5	15	2,024	3
Indiana	Non-Fed. Public	-	304	304	1,065	30	4
	Private	-	140	140	420	229	4
	Total	-	444	444	1,485	259	8
Iowa	Non-Fed. Public	-	20	20	125	22,534	87
	Private	-	3	3	8	134	4
	Total	-	23	23	133	22,668	91
Ohio	Non-Fed. Public	-	55	55	200	24	2
	Private	-	566	566	2,838	1,326	26
	Total	-	621	621	3,038	1,350	28
Michigan	Non-Fed. Public	972	82	1,054	2,500	2,222	42
	Private	1,243	21	1,264	3,624	2,256	53
	Total	2,215	103	2,318	6,124	4,478	95
Minnesota	Non-Fed. Public	461	46	507	814	85,426	581
	Private	39	7	46	123	6,987	56
	Total	500	53	553	937	92,413	637
Wisconsin	Non-Fed. Public	821	81	902	2,545	107,949	837
	Private	784	120	904	4,651	25,758	297
	Total	1,605	201	1,806	7,196	133,707	1,134
Region	Non-Fed. Public	2,254	588	2,842	7,249	218,185	1,553
	Private	2,066	862	2,928	11,679	38,714	443
Region Total, Second		4,320	1,450	5,770	18,928	256,899	1,996

Text Table 1. (Cont'd.) Summary of Local Control on State and Private Lands,
North Central Region, 1949, Bureau-State Funds,
B.L.R.-3.

State	Ownership Class	Acres White Pine Protected		Acres Worked	Ribes Destroyed	Man- Days Used	
		Natural	Planted				
		Total					
Third and Other Workings							
Illinois	Private	-	20	20	50	13,058	23
Indiana	Non-Fed. Public	-	418	418	2,247	45	5
	Private	-	58	58	612	35	2
	Total	-	476	476	2,859	80	7
Iowa	Non-Fed. Public	180	-	180	283	11,309	202
Ohio	Private	33	77	110	754	83	5
Michigan	Non-Fed. Public	403	21	424	1,076	13,776	80
	Private	1,252	-	1,252	3,439	4,169	66
	Total	1,655	21	1,676	4,515	17,945	146
Minnesota	Private	38	100	138	267	15,565	98
Wisconsin	Non-Fed. Public	3,179	409	3,588	5,727	118,785	1,043
Region	Non-Fed. Public	3,762	848	4,610	9,333	143,915	1,330
	Private	1,323	255	1,578	5,122	32,910	194
Region Total, Third		5,085	1,103	6,188	14,455	176,825	1,524
All Workings							
Illinois	Private	-	33	33	91	20,623	34
Indiana	Non-Fed. Public	-	812	812	3,462	75	10
	Private	-	630	630	3,016	3,164	37
	Total	-	1,442	1,442	6,478	3,239	47
Iowa	Non-Fed. Public	180	27	207	433	40,004	312
	Private	-	9	9	53	6,387	27
	Total	180	36	216	486	46,391	339
Ohio	Non-Fed. Public	-	366	366	1,525	22,026	80
	Private	33	1,293	1,326	5,760	2,438	52
	Total	33	1,659	1,692	7,285	24,464	132
Michigan	Non-Fed. Public	2,070	324	2,394	5,513	35,089	199
	Private	3,580	464	4,044	16,279	29,459	289
	Total	5,650	788	6,438	21,792	64,548	488
Minnesota	Non-Fed. Public	501	46	547	854	85,472	598
	Private	130	162	292	682	49,554	290
	Total	631	208	839	1,536	135,026	888
Wisconsin	Non-Fed. Public	4,885	599	5,484	10,025	276,987	2,281
	Private	5,744	615	6,359	33,072	59,056	612
	Total	10,629	1,214	11,843	43,097	336,043	2,893
Region	Non-Fed. Public	7,636	2,174	9,810	21,812	459,653	3,480
	Private	9,487	3,206	12,693	58,953	170,691	1,341
Region Total, All Workings		17,123	5,380	22,503	80,765	630,344	4,821

Text Table 2. Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942-1949, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Destroyed	Man- Days Used
		Natural	Planted	Total			
		<u>Initial Working</u>					
Illinois	Non-Fed. Public	-	68	68	922	16,435	97
	Private	-	371	371	6,322	134,868	421
	Total	-	439	439	7,244	151,303	518
Indiana	Non-Fed. Public	-	294	294	2,289	2,622	29
	Private	3	2,968	2,971	19,807	79,135	398
	Total	3	3,262	3,265	22,096	81,757	427
Iowa	Non-Fed. Public	60	133	193	1,677	185,676	1,470
	Private	98	133	231	2,240	178,379	1,721
	Total	158	266	424	3,917	364,055	3,191
Ohio	Non-Fed. Public	-	1,504	1,504	5,544	46,614	656
	Private	127	2,966	3,093	20,942	55,553	594
	Total	127	4,470	4,597	26,486	102,167	1,250
Michigan	Non-Fed. Public	3,814	2,663	6,477	23,541	178,155	917
	Private	19,094	4,722	23,816	95,262	881,241	5,476
	Total	22,908	7,385	30,293	118,803	1,059,396	6,393
Minnesota	Non-Fed. Public	3,019	228	3,247	5,627	477,502	5,463
	Private	208	80	288	1,014	76,317	362
	Total	3,227	308	3,535	6,641	553,819	5,825
Wisconsin	Non-Fed. Public	38,700	5,068	43,768	134,111	646,405	4,410
	Private	59,682	2,263	61,945	191,279	757,336	4,557
	Total	98,382	7,331	105,713	325,390	1,403,741	8,967
Region	Non-Fed. Public	45,593	9,958	55,551	173,711	1,553,409	13,042
	Private	79,212	13,503	92,715	336,866	2,162,829	13,529
Region Total, Initial		124,805	23,461	148,266	510,577	3,716,238	26,571

Text Table 2. (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942 to 1949, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Destroyed	Man- Days Used
		Natural	Planted	Total			
		<u>Second Working</u>					
Illinois	Non-Fed. Public	102	847	949	3,719	140,235	927
	Private	28	220	248	1,515	24,967	244
	Total	130	1,067	1,197	5,234	165,202	1,171
Indiana	Non-Fed. Public	-	1,226	1,226	6,065	12,495	166
	Private	67	1,264	1,351	9,688	30,237	141
	Total	67	2,490	2,577	15,753	42,732	307
Iowa	Non-Fed. Public	40	117	157	1,135	201,745	1,114
	Private	142	269	411	3,361	242,005	2,079
	Total	182	386	568	4,496	443,750	3,193
Ohio	Non-Fed. Public	-	1,578	1,578	7,612	10,759	287
	Private	290	1,611	1,901	12,242	44,627	600
	Total	290	3,189	3,479	19,854	55,386	887
Michigan	Non-Fed. Public	14,707	4,204	18,911	39,620	284,431	1,851
	Private	35,239	2,465	37,704	116,122	1,061,927	7,712
	Total	49,946	6,669	56,615	155,742	1,346,358	9,563
Minnesota	Non-Fed. Public	6,308	339	6,647	9,518	318,455	3,322
	Private	67	9	76	330	17,202	113
	Total	6,375	348	6,723	9,848	335,657	3,435
Wisconsin	Non-Fed. Public	17,666	5,918	23,584	52,125	552,050	4,952
	Private	40,704	1,162	41,866	119,075	958,790	9,789
	Total	58,370	7,080	65,450	171,200	1,510,840	14,741
Region	Non-Fed. Public	38,823	14,229	53,052	119,794	1,520,170	12,619
	Private	76,557	7,000	83,557	262,333	2,379,755	20,678
Region Total, Second		115,380	21,229	136,609	382,127	3,899,925	33,297

Text Table 2. (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942 to 1949, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Destroyed	Man-Days Used
		Natural	Planted	Total			
<u>Third and Other Workings</u>							
Illinois	Non-Fed. Public	90	254	344	2,376	100,493	695
	Private	5	597	602	2,552	63,822	611
	Total	95	851	946	4,928	164,315	1,306
Indiana	Non-Fed. Public	61	544	605	3,037	2,851	41
	Private	102	183	285	2,893	9,216	48
	Total	163	727	890	5,930	12,067	89
Iowa	Non-Fed. Public	446	10	456	1,217	104,130	1,110
	Private	27	4	31	363	22,935	209
	Total	473	14	487	1,580	127,065	1,319
Ohio	Non-Fed. Public	420	769	1,189	2,428	3,684	84
	Private	887	227	1,114	5,707	15,965	224
	Total	1,307	996	2,303	8,135	19,649	308
Michigan	Non-Fed. Public	2,816	3,486	6,302	13,018	74,204	750
	Private	11,082	279	11,361	33,461	296,598	2,877
	Total	13,898	3,765	17,663	46,479	370,802	3,627
Minnesota	Non-Fed. Public	2,491	179	2,670	3,179	86,294	880
	Private	191	375	566	1,453	111,275	726
	Total	2,682	554	3,236	4,632	197,569	1,606
Wisconsin	Non-Fed. Public	5,070	1,810	6,880	12,182	383,651	3,569
	Private	1,868	22	1,890	7,579	86,463	728
	Total	6,938	1,832	8,770	19,761	470,114	4,297
Region	Non-Fed. Public	11,394	7,052	18,446	37,437	755,307	7,129
	Private	14,162	1,687	15,849	54,008	606,274	5,423
Region Total, Third		25,556	8,739	34,295	91,445	1,361,581	12,552

Text Table 2. (Cont'd.) Cumulative Summary of Local Control on State and Private Lands, North Central Region, 1942 to 1949, Bureau-State Funds, B.L.R.-3.

State	Ownership Class	Acres White Pine Protected			Acres Worked	Ribes Destroyed	Man- Days Used
		Natural	Planted	Total			
<u>All Workings</u>							
Illinois	Non-Fed. Public	192	1,169	1,361	7,017	257,163	1,719
	Private	33	1,188	1,221	10,389	223,657	1,276
	Total	225	2,357	2,582	17,406	480,820	2,995
Indiana	Non-Fed. Public	61	2,064	2,125	11,391	17,968	236
	Private	192	4,415	4,607	32,388	118,588	587
	Total	253	6,479	6,732	43,779	136,556	823
Iowa	Non-Fed. Public	546	260	806	4,029	491,551	3,694
	Private	267	406	673	5,964	443,319	4,009
	Total	813	666	1,479	9,993	934,870	7,703
Ohio	Non-Fed. Public	420	3,851	4,271	15,584	61,057	1,027
	Private	1,304	4,804	6,108	38,891	116,145	1,418
	Total	1,724	8,655	10,379	54,475	177,202	2,445
Michigan	Non-Fed. Public	21,337	10,353	31,690	76,179	536,790	3,518
	Private	65,415	7,466	72,881	244,845	2,239,766	16,065
	Total	86,752	17,819	104,571	321,024	2,776,556	19,583
Minnesota	Non-Fed. Public	11,818	746	12,564	18,324	882,251	9,665
	Private	466	464	930	2,797	204,794	1,201
	Total	12,284	1,210	13,494	21,121	1,087,045	10,866
Wisconsin	Non-Fed. Public	61,436	12,796	74,232	198,418	1,582,105	12,931
	Private	102,254	3,447	105,701	317,933	1,802,589	15,074
	Total	163,690	16,243	179,933	516,351	3,384,695	28,005
Region	Non-Fed. Public	95,810	31,239	127,049	330,942	3,828,886	32,790
	Private	169,931	22,190	192,121	653,207	5,148,858	39,630
Region Total, All Workings		265,741	53,429	319,170	984,149	8,977,744	72,420

Note: In Text Table 2, work done on State and Private Lands, by Bureau-State funds and 3103 Intermingled Lands funds is shown for the period 1942-1949 only, or since the Lee Act became effective. For total work done on State and Private Lands, 1917 to 1949, see Table 8.

Text Table 3. Status of Control on Non-Federal and Privately-owned White Pine Stands.
North Central Region, December 31, 1949.

Ownership Class	Acres, Total Control Problem			Acres, Initially Worked			Acres Not Initially Worked			Acres on Maintenance	
	Natural		Total	Natural		Total	White		Control	White	Control
	W.P.	W.P.	W.P.	W.P.	W.P.	W.P.	Pine	Area	Pine	Area	
Illinois											
Non-Fed. Public	197	912	1,109	6,203	192	910	1,102	6,089	7	114	543
Private	34	803	837	7,194	34	748	782	5,079	55	2,115	54
Total	231	1,715	1,946	13,397	226	1,658	1,884	11,168	62	2,229	597
Indiana											
Non-Fed. Public(a)	99	2,713	2,812	18,395	99	2,660	2,759	17,049	53	1,346	2,479
Private	224	6,370	6,594	171,136	224	5,023	5,247	62,067	1,347	109,069	3,866
Total	323	9,083	9,406	189,531	323	7,683	8,006	79,116	1,400	110,415	6,345
Iowa											
Non-Fed. Public	348	218	566	3,433	348	217	565	3,413	1	20	11
Private	366	4,882	5,248	46,133	316	2,480	2,796	30,390	2,452	15,743	1,590
Total	714	5,100	5,814	49,566	664	2,697	3,361	33,803	2,453	15,763	1,601
Ohio											
Non-Fed. Public(b)	797	6,008	6,805	55,550	796	4,454	5,250	40,847	1,555	14,703	1,495
Private	2,355	11,373	13,728	396,114	2,242	7,552	9,794	133,712	3,934	262,402	4,299
Total	3,152	17,381	20,533	451,664	3,038	12,006	15,044	174,559	5,489	277,105	5,794
Michigan											
Non-Fed. Public	98,461	30,404	128,865	309,865	95,369	29,249	124,618	291,970	4,247	17,895	55,139
Private	193,618	14,094	207,712	713,488	171,450	11,733	183,183	621,807	24,529	91,681	56,393
Total	292,079	44,498	336,577	1,023,353	266,819	40,982	307,801	913,777	28,776	109,576	111,532

(continued)

Text Table 3. (Cont'd.) Status of Control on Non-Federal and Privately-owned White Pine Stands,
North Central Region, December 31, 1949.

Ownership Class	Acres, Total Control Problem			Acres, Initially Worked			Acres Not Initially Worked		Acres on Maintenance	
	Natural	Planted	Total	Natural	Planted	Total	White	Control	White	Control
	W.P.	W.P.	W.P.	W.P.	W.P.	W.P.	Pine	Area	Pine	Area
Minnesota										
Non-Fed. Public	47,606	6,441	54,047	33,197	5,408	38,605	75,084	37,190	12,790	24,270
Private	86,095	337	86,432	65,878	335	66,213	204,411	67,289	14,967	36,201
Total	133,701	6,778	140,479	99,075	5,743	104,818	279,495	104,479	27,757	60,471
Wisconsin										
Non-Fed. Public	80,966	16,002	96,968	79,617	15,600	95,217	264,899	2,366	50,702	139,155
Private	252,294	9,313	261,607	208,290	7,441	215,731	795,395	231,232	93,268	329,629
Total	333,260	25,315	358,575	287,907	23,041	310,948	1,060,294	233,598	143,970	468,784
Region										
Non-Fed. Public	228,474	62,698	291,172	209,618	58,498	268,116	699,351	73,634	123,159	322,960
Private	534,986	47,172	582,158	448,434	35,312	483,746	1,852,861	779,531	174,437	706,260
Region Total	763,460	109,870	873,330	658,052	93,810	751,862	2,552,212	853,165	297,596	1,029,220
Includes U. S. Army										
Lands as follows:										
(a)	-	42	42	-	37	37	202	152	37	202
(b)	-	156	156	-	136	136	1,237	438	51	474

Text Table 4. Costs of Cooperative Control Program, B.L.R.-3,
North Central Region, 1941 to 1949

State	Period of Time (Calendar Years)	State Direct Aid	Bureau 3103, 73.14 and W-c.14 Funds	Bureau Intermingled Lands 3103	Total
Illinois	1941-1948	\$ 31,531.63	\$ 22,398.33	-	\$ 53,929.96
	1949	4,824.02	74.79	-	4,898.81
	Total	36,355.65	22,473.12	-	58,828.77
Indiana	1941-1948	3,447.34	10,701.42	-	14,148.76
	1949	5,230.55	949.22	-	6,179.77
	Total	8,677.89	11,650.64	-	20,328.53
Iowa	1941-1948	16,591.00	48,820.94	-	65,411.94
	1949	1,137.37	3,740.15	-	4,877.52
	Total	17,728.37	52,561.09	-	70,289.46
Ohio	1941-1948	5,264.56	33,382.58	-	38,647.14
	1949	720.80	6,995.59	-	7,716.39
	Total	5,985.36	40,378.17	-	46,363.53
Michigan	1941-1948	64,126.65	116,668.74	17,660.34	198,455.73
	1949	12,143.04	8,074.02	-	20,217.06
	Total	76,269.69	124,742.76	17,660.34	218,672.79
Minnesota	1941-1948	54,979.27	114,380.28	32,490.17	201,849.72
	1949	14,947.27	7,847.44	-	22,794.71
	Total	69,926.54	122,227.72	32,490.17	224,644.43
Wisconsin	1941-1948	103,019.57	126,377.63	15,799.59	245,196.79
	1949	30,096.25	13,254.64	-	43,350.89
	Total	133,115.82	139,632.27	15,799.59	288,547.68
Region	1941-1948	278,960.02	472,729.92	65,950.10	817,640.04
	1949	69,099.30	40,935.85	-	110,035.15
Region Total		348,059.32	513,665.77	65,950.10	927,675.19

Status of Control for State and Private Lands

By STATES

NORTH CENTRAL REGION

To December 31, 1949
(Based on Text Table 3)

ACRES IN CONTROL AREA

1,200,000

1,050,000

900,000

750,000

600,000

450,000

300,000

150,000

0

Legend:



Control Area
Acres Unworked



Control Area Acres Initially
Worked but Not On
Maintenance



Control Area Acres
Initially Worked
and On Maintenance

13,397 Acres

49,566 Acres

189,531 Acres

383,974 Acres

451,664 Acres

1,293,892 Acres

1,023,353 Acres

Ill. Iowa Ind. Minn. Ohio Mich. Wis.

ACRES IN CONTROL AREA

2,400,000

2,100,000

1,800,000

1,500,000

1,200,000

900,000

600,000

300,000

0

2,632,302 Acres

772,985 Acres

Non-Fed. Public Private

REGION

BLISTER RUST CONTROL ON NATIONAL FORESTS

NORTH CENTRAL REGION, 1949

Objective

The protection of valuable white pine stands from blister rust by the removal of ribes from within infecting range of the trees is being continued on all of the National Forests of the Region. Ribes eradication work is up to schedule on all the Forests with the exception of the Superior. The objective of getting as many areas on a maintenance basis as soon as possible was furthered considerably through blister rust control work done in 1949. The term "maintenance", as used in blister rust control, refers to a condition where no further ribes eradication work is believed necessary to bring the present crop of pine through to merchantable size without serious losses from blister rust.

Memorandum of Understanding

Control work on National Forest lands is performed through a written Memorandum of Understanding between the Forest Service and the Bureau of Entomology and Plant Quarantine. The Forest Service is responsible for selection of pine areas to be protected, employment of labor and supervision and operation of camps. The Bureau is responsible for preparing work plans and maps, which it submits to the Forest Service for approval, keeping records, training labor and supervision, checking for adequacy of control work and making reports.

General Status of Control

Of the twelve National Forest units in the Region only nine are concerned with blister rust. The Shawnee, Hoosier and Wayne each have only a very small acreage of white pine, very few ribes, and no known blister rust infection. For all practical purposes the white pine in them is on maintenance. As one goes farther North he will see more white pine, find greater numbers of ribes and observe more blister rust infection until he reaches the Superior which excels in all three.

The status of blister rust control on the individual Forests roughly follows the same geographical pattern ranging from 100 percent of the white pine on maintenance on the Hoosier in Indiana to only 11 percent on the Superior in Minnesota.

The control program on all Forests is right up to schedule except on the Superior. The problem on this Forest is of such magnitude that it has not been possible with funds available in the last few years to keep up with the disease. Many unprotected stands of young pine are being lost to the rust and another considerable acreage of initially protected pine is not being reworked in time to prevent the reestablishment of ribes. On recognition of the fact that the control program on the Superior is larger than the annual allotment of funds will permit to catch up with it, a more realistic approach to the problem has recently been inaugurated. Since it is impossible to protect all of the worthwhile white pine on the Forest a resurvey program is in progress which will permit a review of areas on a priority basis. Only areas which are to be managed for white pine will be included in the control program and those on a basis of relative cost of protection. Thus the size of the control problem will be reduced and be commensurate with the funds available for doing control work.

Text Table 7 shows the General Status of Control on each of the National Forests.

Rust Conditions in 1949

There was nothing unusual about the occurrence of the rust on ribes in 1949. The season seems to have been a normal one with long dry spells in some parts of the Region and cool, moist, periods in others but no general climatic condition which could be said to either favor or hinder the spread of the rust. Nor were there any startling discoveries of rust on pine, just the usual insidious intensification in unprotected stands. Examinations made during the year confirmed the earlier observations that the year 1944 had been especially favorable for pine infection, especially in Minnesota.

Control Work in 1949

Labor was readily available on all Forests. The amount of eradication work done was determined by the work scheduled for 1949 and by funds available for doing the work. Supervision was adequate and Bureau personnel was able to devote as much time as was necessary to training crews, giving general direction to the work and checking it. In general, scheduled control work on all the Forests was completed, and it checked out very satisfactorily. Local labor was employed except on the Superior where in addition to local men much of the work was done out of three Forest Service camps.

Compared with the previous year, accomplishment in 1949 was slightly more than in 1948 with fewer man-days used.

Local Control Performed on National Forests,
North Central Region, 1949

Eradication	Acres White Pine Protected	Acres Worked	Ribes Destroyed	Man-Days Used
Initial	3,252	5,905	226,655	2,358
Reeradication	11,308	18,940	275,014	4,113
Total	14,560	24,845	501,669	6,471

The proportion of reeradication work being done compared to initial work is a good index of progress being made in catching up on the control problem. The more reeradication the better the progress. It indicates that worthwhile new areas are being taken care of and that sufficient funds are left to rework other valuable areas before ribes become re-established. There will always be some initial work each year because of new white pine areas coming in through natural reproduction or planting. The amount of reeradication to be done will diminish as more areas are put on a maintenance basis. Right now, however, we are still trying to catch up on the rework of areas that were initially protected in the hey-day of Emergency programs when C.C.C. and W.P.A. labor was plentiful.

Text Table 5 shows the amount of Local Control work done on each Forest in 1949.

Text Table 6 shows the quality of work done. It will be noted that all of the work done on all Forests except the Superior in 1949 checked well within the required standard of 25 feet of live stem or less per acre remaining after eradication. Only one area (154 acres) on the Superior had more than the allowable maximum F.L.S. per acres remaining and this area will have to be cleaned up in the Spring of 1950. All in all a high quality of work was done on National Forests in 1949. Text Tables 8 and 9 show all ribes eradication work done on the National Forests from the inception of the control program through 1949. Text Table 10 shows Forest Service expenditures charged to blister rust control in 1949.

A resume' of the Status of Control on each Forest follows. A more detailed account can be had by reading the separate individual report for each Forest.

Status of Control by Forests

Shawnee, Hoosier and Wayne National Forests

No blister rust control work performed in 1949. None needed as the small white pine acreage has few or no ribes and is free of the blister rust disease.

Huron National Forest - Michigan

The Huron contains 1853 acres of white pine that is considered as worth protecting from blister rust. Roughly one-third of it is natural pine and two-thirds is planted. All but 15 acres has been given initial protection and 56 percent is on maintenance. In 1949, five areas were worked involving the removal of 1044 ribes from 900 acres at a cost of 25 man-days. The work was done by one man paid from Forest Service funds. It was checked and found satisfactory by the District Agent.

Rust on ribes was light this year and there was no significant increase in pine infection. It is generally light and occurs in only a few widely separated areas.

For 1950 a small amount of preeradication survey work is recommended for 5 possible areas and about 9 plantations should be post-checked. It is estimated that about 20 man-days of eradication work will be sufficient to maintain the schedule of protection on the Huron for 1950.

Manistee National Forest - Michigan

The Manistee is the most suitable Forest in the Region for the planting of white pine. It now contains 20,251 acres of planted white pine or about 40 percent of the total white pine acreage planted on all the National Forests in the Region. Control work is up to schedule with 100 percent of the white pine initially protected and 96 percent on maintenance.

Rust conditions on the Manistee are not severe. Much of the pine grows on well drained sandy soil under oak, a type which does not harbor ribes to any extent. It is only in isolated low places and on typical hardwood soils where they occur in any number. Pine infection is lightly scattered over the Forest but not intensive enough to do commercial damage. A few nearby gooseberries are usually responsible.

Preeradication surveys of new areas made in 1949 resulted in the mapping of 12 areas consisting of 25 acres of natural pine and 244 planted.

Ribes eradication was performed on 15 areas. A total of 279 acres of pine was protected by the removal of 2,088 ribes from 1240 acres of control area using 18 man-days. The work was done by one man paid from Forest Service funds. All worked areas were checked by the District Agent and found to be satisfactory.

The Chittenden Nursery was given the 11th working which resulted in the removal of 378 ribes. The Chittenden Annex was also worked, resulting in the removal of 9,918 bushes. In addition 135 clumps of swamp red currant were sprayed with 2,4,5-T solution.

To keep the control work up to schedule it is recommended that preeradication surveys be made of all white pine plantations planted in the fall of 1949 and spring of 1950 and perform whatever ribes eradication work might be needed on them. Also check for any areas that may recently have been transferred from private to federal ownership and work if necessary. It is estimated that only about 15 man-days of ribes eradication work may be needed to protect the federally-owned pine on this Forest in 1950.

Marquette National Forest - Michigan

The Marquette has 6,658 acres of natural white pine and 4,981 acres of planted. All of it has been given initial protection and about half of it is on maintenance. Pine infection can be found generally scattered over the Forest but not in damaging amounts. In unprotected scattered pine blister rust damage is quite severe but only an occasional canker can be found in protected areas. There is one exception. One pine area, or mixed plantation of white and red pine, has many cankers throughout. The trees are about 10 feet high and three inches at the base. Many of them have stem cankers within one foot of the ground. Over 95 percent of the infection occurred before ribes eradication was performed.

Ribes infection was severe on the Marquette in 1949. It was nearly impossible to find a single bush that was not infected.

The ribes population on the Marquette runs from very light on the sandy soils to very heavy in the limestone rock country. Pine areas in the latter locations must be worked several times before they can be placed on maintenance.

Local control work performed in 1949 brought the work on the Marquette up to schedule. A Forest Service crew of nine men started eradication work on the Moran District early in May and cleaned up all areas scheduled for work. This crew deserves a word of praise. Agent Sager reports that they were the best eradication crew he has ever seen on the Upper Michigan. The men were exceptionally good workers. Also, the Ranger and Assistant Ranger at Moran seem to possess a type of influence that makes men strive for good work. Another crew of nine men cleaned up four areas on the Raco District. They also did very good work.

Both the Moran and Raco Districts are now up to date with no more eradication work anticipated for Raco until 1951 and Moran in 1954.

Hiawatha National Forest - Michigan

White pine has been reproducing steadily on the Hiawatha in the last few years. Surveys made in 1949 added 1,777 acres of white pine to the total. This increase is due to increased natural reproduction. In addition to the added acreage it is estimated that 60 percent of the previously reported acreage has improved in stocking. The future of white pine on this Forest is good.

The Hiawatha now contains 13,439 acres of good federally-owned white pine. Practically all of it is in the younger age classes. All but 598 acres has been given initial protection and 43 percent is on maintenance.

Pine infection is lightly scattered all over the Forest but no serious commercial damage is present in any of the protected stands. Wherever ribes occur near white pine the inevitable blister rust "flag" may be seen.

Ribes are comparatively light on the Hiawatha. There are sites with ribes populations in all degrees but they are well-defined and the cost of eradicating them is very reasonable.

Considerable survey work was done by Bureau personnel on the Hiawatha in 1949. Five new areas were mapped and 26 were remapped and post-checked. As previously stated this work revealed a substantial increase in pine acreage and stocking on the Forest.

No eradication program was carried on in this Forest in 1949 it being felt that it was more expedient to concentrate on the Marquette Forest this year and devote full time to the Hiawatha later. Some work was done by the Bureau. Four areas were worked in all, three initially and one rework. This amounted to little more than scouting as ribes were very light. The Bureau mapper did the work himself and was able to place all four areas on maintenance. A total of 425 acres of pine was protected by removing 759 ribes from 1,520 acres at a cost of 8 man-days.

As a result of the surveys made in 1949 a work program for 1950 is recommended for the Hiawatha. It calls for protection of 4,588 acres of pine by working 9,985 acres of control area at an estimated expenditure of 774 man-days.

Ottawa National Forest - Michigan

The Ottawa has more ribes and more blister rust infection than any other National Forest in Michigan. It has 11,754 acres of federally-owned white pine in its blister rust control problem. All but 416 acres have been given initial protection and 30 percent of the total acreage is on maintenance. The largest part of the white pine is made up of natural stands of saplings and poles. A few good cone crops during the recent wet weather cycle have favored reproduction.

Blister rust on pine can be found in every stand on the Forest. Timely ribes eradication has prevented serious commercial damage in the worked areas but some of the unprotected stands have a high degree of infection.

Infection on ribes is usually heavy throughout the Forest every year. This condition makes it imperative that the footage of ribes live stem per acre be reduced as much as is economically possible

on worked areas and it must be kept well below the Regional standard of 25 F.L.S. per acre.

Due to the heavy clay type of soil in most parts of the Ottawa, ribes are numerous and have luxurious growth. It takes several workings to bring most of the areas to a maintenance status. It is encouraging to note the great reduction in the number of ribes bushes destroyed on second and succeeding workings compared with those found on initial work. Great care must be taken to get the roots to prevent a ribes come-back and this is especially difficult on the heavy, rocky soils found on the Ottawa. In the initial working ribes averaged 148 bushes per acre throughout the Forest and only 36 per acre on rework. A sound schedule of control work is being maintained and each year the problem is becoming less difficult.

Ribes eradication work in 1949 was started in the Iron River District on August 2 with a crew of 24 men reporting for work. Starting so late in the season is not conducive to getting the most and best work done per man-day but the work had to be postponed until Forest Service funds were available. Ordinarily eradication work is started just as soon as the first ribes leaves appear in May, as it is at this time of year that optimum conditions prevail for finding and uprooting ribes. Fortunately over half of the crew consisted of men with previous blister rust control experience so there wasn't much time lost on training under adverse conditions. All areas scheduled for work in 1949 on the Iron River and Watersmeet Districts were completed but the scheduled work on the Ontonagon District had to be postponed. Despite the late season start the crews did excellent work. Many checks were made as the work progressed and only an extremely small amount of live stem was found after the crews had covered the area. Of the 8 areas worked in 1949 only two were initial eradication and 6 were reeradication. A total of 1,172 acres of pine were given protection by removing 30,641 ribes from 2,220 acres of control area at an expenditure of 620 man-days.

A schedule of work recommended for the 1950 season proposes the working of 12 areas involving 2,395 acres to be worked at an estimated expenditure of 635 man-days. It is hoped that Forest Service funds will be available so that the work can be started early in spring when optimum eradication conditions prevail.

Nicolet National Forest - Wisconsin

The total control problem on the Nicolet includes 12,386 acres of white pine of which roughly half is natural and the other half is planted pine. Ninety-nine percent of this acreage has been given initial protection and 37 percent is on maintenance.

Natural restocking of white pine continues to increase, particularly on the Lakewood District, wherever seed trees are present and the site is favorable. Planted pine however is not doing as well and the discarding of some plantations from the control problem has been necessary. Encroachment of brush and hardwood browsing, and blister rust damage are all factors contributing to this acreage loss. Growth

and survival are good, however, wherever the site is favorable. Ribes are generally distributed over the Forest, more abundant in swamp and hardwood types, and scarce to absent on the lighter soils.

Blister rust infection on pine is prevalent throughout the Forest and is doing considerable damage in unprotected stands. During the past two years a large number of new cankers have been noted particularly on 1944 and 1945 wood indicating that infection conditions were very favorable for the spread of the rust in those years. Fortunately most of the worthwhile areas had been given initial protection by that time and it was only in unprotected stands and in areas where rework had been delayed too long that the wave of infection made itself felt.

Only two areas were worked during the 1949 season, one each on the Lakewood and Eagle River Districts. All control work was third eradication on plantation acreage. Very satisfactory work was performed and progress was fair to excellent. These factors contributed to the successful work:

1. As the result of the small planting program, it was possible to start ribes eradication work earlier than usual, thus taking advantage of the best working conditions. All scheduled work was completed by June 15.
2. Nearly all crew personnel had previous experience in ribes eradication work.
3. Adequate supervision was provided for the two 6-man crews employed on each district.

A total of 484 man-days was used to eradicate 41,799 ribes from 1,630 acres of control area. This gave protection to 1,150 acres of planted pine.

The proposed work plan recommended for the fiscal year 1951 and submitted to the Forest Supervisor involves the working of 1,240 acres of control area to protect 524 acres of pine at an estimated cost of 380 man-days.

Chequamegon National Forest - Wisconsin

There are at present 21,024 acres of white pine in the control problem of the Chequamegon Forest. About three-fourths of this acreage is natural pine and one-quarter planted. Roughly 80 percent is located in the Washburn District. Most of this pine is in the younger age classes ranging from seedlings to poles. In recent years because of adequate fire protection, favorable climatic conditions and trees coming of seed-bearing age, there has been a pronounced increase in white pine reproduction. There is every indication that the white pine acreage and degree of stocking will continue to increase on this Forest.

Over 95 percent of the pine has been given initial protection and nearly 50 percent is on maintenance. White pine infection on the Forest varies in intensity from very light to medium heavy depending upon ribes distribution and time of eradication. Many small inadequately stocked areas not included in the control problem and therefore never protected have a high degree of infection. Some infection can also be found in certain protected stands. This can be attributed to one of two causes: either the rust came in before initial work was done or there was too long a period between initial and rework. The latter was sometimes unavoidable because of the scarcity of labor during the war years. In the early 1940's it was almost impossible to maintain a schedule of rework on the great number of areas that were initially protected during the period of emergency programs when C.C.C. and W.P.A. labor was plentiful.

The control schedule on the Forest is now again on an even keel. In 1949 a satisfactory amount of work was done. Eradication crews worked on three of the five Ranger Districts, Glidden, Hayward and Washburn. A total of 2,562 acres of pine was protected by removing 163,570 bushes from 4,377 acres of control area at an expenditure of 1,817 man-days. A good grade of labor was available and supervision was adequate. Checking after eradication proved that very good work was done. All areas checked out with less than 15 F.L.S. per acre remaining, a comfortable margin from the 25 feet allowed. By far the largest amount of acreage worked this year was third eradication and it was possible to place most of these areas on maintenance.

A good sized control program is needed and recommended for the Fiscal Year 1951. The proposed work plan has been made up and submitted to the Supervisor for approval. It includes work on all Ranger Districts except Medford. A total of 3,907 acres of pine is in need of protection in 1951. This will involve the working of 5,636 acres of control area which will require an estimated use of 1,488 man-days. The larger part of it will be rework of areas previously worked five or more years ago. Several new areas of white pine reproduction have been found on the Glidden and Washburn Districts and because of the imminence of the rust are recommended for protection in 1951.

Superior National Forest - Minnesota

The Superior offers a challenge to Blister Rust Control men. It has a lot of pine, much of it off the beaten path, a heavy ribes population and climatic conditions that are extremely favorable to the spread of the rust. Of the 85,165 acres of white pine included in the control problem in 1948 only 33.4 percent had been given initial protection and less than 3 percent was on maintenance. This in spite of the considerable control program carried on during C.C.C. and W.P.A. days. Obviously, with considerably less regular funds that are currently available it would be impossible to make substantial progress in protecting all of the good white pine on the Superior. In fact it is difficult with the funds now available annually to even keep abreast of the rework that must be done on areas worked initially five or more years ago, let alone giving initial protection to new areas. As natural reproduction keeps coming in old areas are becoming

better stocked and new areas are becoming established.

To take a more realist view of the problem and use the blister rust control dollar where it will do the most good it was decided early in 1949 to re-evaluate the pine areas and place them on a revised priority basis. Since with the present annual allotment of funds it would not be possible to give protection to all the good areas it is just good business to provide and maintain protection on the very best areas first.

Accordingly a new survey was undertaken in 1949. Trained field crews not only mapped the pine areas but obtained the latest information on age class, degree of stocking, amount of pine infection, ribes conditions and probable cost of protection. Special emphasis was also placed on kind and amount of other valuable species in the stand. Costs of protecting the white pine are weighed against returns that might be expected if the white pine were lost. Where it is found that a fair return can be expected even though the stand is not managed for white pine the area is dropped from the blister rust control problem in favor of the other species.

Surveys of this kind conducted in 1949 and a further review of existing records decreased by 10,644 acres, or 13 percent, the white pine in control problem. Some of the principle reasons for this reduction were:

1. Overvaluing white pine and undervaluing other associated species in the original survey. (67.5% reduction)
2. Excessive amount of rust present. (10.0%)
3. More complete data in the new surveys. (9%)
4. W. P. Planting Sites not Planted. (7.5%)
5. Inaccessible pine located in roadless and no-out areas. (3.5)
6. Plantation failures. (1.0%)
7. Cutting and logging. (1.0%)
8. Too many ribes, areas too small to protect, etc. (0.5%)

A further revision downward of pine acreage can be expected with the completion of surveys on the Kabetogama, LaCroix and Tofte Districts in 1950.

Currently there are 74,521 acres of white pine in the control problem on the Superior. The status of control as of December 31, 1949 is 38.6 percent of this acreage initially protected with 11.1 percent on maintenance.

Rust conditions on the Superior are more pronounced than anywhere else in the Region. Pine infection in varying degrees occurs in nearly every stand. The records show that 2,419 acres of unprotected white pine have been removed from the control problem because of excessive rust damage. Another considerable acreage of white pine reproduction has never been mapped because the rust has taken its toll of young seedlings before enough of them could become established to meet stocking requirements. On the other hand disease surveys show that losses from the rust have been kept down to less than 10 percent in stands where initial and the necessary reworkings have been done in time.

Local control in 1949 gave protection to 2,565 acres of pine. Ribes eradication work was done on the Aurora, Gunflint, Isabella, Kawishiwa, LaCroix and Mesaba Districts. A total of 153,817 ribes were destroyed by working 3,178 acres of control area at an expenditure of 2,450 man-days. The work was done out of three Forest Service camps, one each on the Gunflint, Isabella and LaCroix Ranger Districts and by local men commuting from their homes.

Very good quality work was performed. Of the 3,178 acres worked and checked only 154 acres exceeded 15 F.L.S. per acre after working.

Work plans for 1950 include a continuation of surveys to complete the white pine reappraisal project on the Forest. Local control work is recommended for the protection of 3,862 acres of pine by working 5,359 acres of control area at an estimated cost of 4,213 man-days.

Chippewa National Forest - Minnesota

The Chippewa has 10,155 acres of federally-owned white pine in its control problem; 8,581 natural and 1,574 planted. Much of it grows in association with older red pine under which it does very well and eventually makes up the larger portion of the succeeding stand. In such situations ribes are usually scarce and cost of control is very nominal.

The status of control is above average with 83.3 percent of the pine protected initially and 63.3 percent on maintenance. Control work on this Forest however, must be kept right up to schedule as the imminence of the rust is such as to present a serious threat to unprotected areas. Plantations on the Forest have been hardest hit. The chief reason for this is one of site. White pines were planted on the heavier soils which support ribes in greater abundance than lighter soils. Then too the planted areas had less cover than the natural stands, which exposed the trees to more infection because of the lack of screening. On the Chippewa, as in any of the other Forests in the northern part of the Region, no young white pine stand can be expected to reach commercial maturity if ribes are permitted to remain within infecting range of the trees.

Survey work on the Forest is up to schedule and the pine acreage listed in the control problem is pretty well stabilized. Doubtful areas have been discarded as a result of reappraisals during the last two years and there will be an increase of worthwhile acreage as new reproduction continues to come in.

Local control work in 1949 was done in the Cut Foot Sioux, Cass Lake, Bena, Remer and Walker Districts by local men commuting from their homes. One man eradication crews were used on all districts except the Cut Foot Sioux. The one man method proved very satisfactory as it is adapted to areas supporting small ribes populations which are common on the Chippewa. A total of 457 acres of pine was protected by removing 72,832 ribes from 727 acres of control area at an expenditure of 484 man-days. Half of the acreage worked was initial and the rest was rework.

Future control plans for the Forest provide for an examination or post-check of one-fifth of the control areas each year, including areas on maintenance. Rework as indicated by post-check will be performed as needed and new areas justifying protection will be added to the plan as surveys are completed and will become part of the five-year rotation. This five-year plan will iron out the hills and valleys of scheduled work and permit an even control program. It will provide protection when needed for new areas and maintenance of protection on areas already initially worked.

For 1950 the local control work plan calls for the protection of 491 acres of pine by working 1,166 acres of control area at an estimated cost of 555 man-days.

Detailed figures for Surveys, Local Control, Checking, Status of Control and Costs are given in the tables immediately following.

A still more detailed account of the work on each forest may be had by reading the separate reports on each forest.

Text Table 5. Local Control on National Forest Lands, by National Forest and Operating Agency.
North Central Region, 1949

National Forest	Operating Agency	No. Areas	Acres White Pine Protected		Acres Control Area Worked	Ribes Bushes Destroyed	Man-Day Used
			Natural	Planted			
			Initial Working				
Huron, Michigan	Bureau-State	1	-	190	210	-	4
	Forest Service	2	-	145	180	201	5
	Sub-total	3	-	335	390	201	6
Manistee, Michigan	Bureau-State	5	-	85	425	2	-
	Forest Service	10	25	169	815	2,086	18
	Sub-total	15	25	254	1,240	2,086	18
Marquette, Michigan	Forest Service	1	275	-	550	8,011	50
	Bureau-State	3	125	-	720	138	4
	Forest Service	2	160	-	345	21,451	246
Ottawa, Michigan	Forest Service	16	1,596	-	1,912	121,523	1,020
	Forest Service	7	228	-	351	61,093	217
	Forest Service	2	254	-	397	11,876	120
Superior, Minnesota	Forest Service	9	125	275	1,355	420	5
	Forest Service	40	2,538	314	4,550	226,235	2,253
	Sub-total	49	2,663	589	5,905	226,655	2,366
Total, Initial Working							

Text Table 5. (Cont'd.) Local Control on National Forest Lands, by National Forest and Operating Agency, North Central Region, 1949

National Forest	Operating Agency	No. Areas	Acres White Pine Protected		Acres Control Area Worked	Ribes Bushes Destroyed	Days
			Natural	Planted			
Second Working							
Huron, Michigan	Forest Service	2	250	210	520	612	17
Marquette, Michigan	Forest Service	1	635	620	2,090	10,057	10
Glawatha, Michigan	Bureau-State	1	100	400	500	141	1
Superior, Minnesota	Forest Service	2	287	287	110	9,046	1
Chippewa, Minnesota	Forest Service	4	10	166	281	7,421	1
Chequamegon, Wisconsin	Forest Service	4	730	-	1,221	11,169	1
All Forests	Bureau-State	1	300	-	800	341	1
	Forest Service	16	2,010	786	4,524	40,665	816
Total Second Working		17	2,310	786	5,096	41,006	17
Third and Other Workings							
Marquette, Michigan	Forest Service	11	3,150	795	5,915	24,165	160
Ottawa, Michigan	Forest Service	6	353	459	1,875	12,100	71
Superior, Minnesota	Forest Service	6	-	402	550	11,568	17
Chippewa, Minnesota	Forest Service	2	-	15	82	3,222	1
Chequamegon, Wisconsin	Forest Service	2	1,368	210	2,759	110,538	1
Nicolet, Wisconsin	Forest Service	2	-	2,150	1,650	13,799	181
All Forests	Bureau-State	None	-	-	-	-	-
	Forest Service	29	5,071	3,111	13,616	234,008	3,293
Total, Third & Other Workings		29	5,071	3,111	13,616	234,008	3,293

Text Table 5. (Cont'd.) Local Control on National Forest Lands, by National Forest and Operating Agency, North Central Region, 1949

National Forest	Operating Agency	No. Areas	Acres White Pine Protected			Acres Control Area Worked	Ribes Bushes Destroyed	Sour Man- Days Used
			Natural	Planted	Total			
All Workings								
Huron, Michigan	Bureau-State	1	-	190	190	210	-	1
	Forest Service	4	240	145	385	690	1,044	23
	Sub-total	5	240	335	575	900	1,044	24
Manistee, Michigan	Bureau-State	5	-	85	85	425	2	-
	Forest Service	10	25	169	194	815	2,086	18
	Sub-total	15	25	254	279	1,240	2,088	18
Marquette, Michigan	Forest Service	16	4,060	1,415	5,475	9,250	43,013	641
	Bureau-State	4	425	-	425	1,520	759	6
	Forest Service	8	713	459	1,172	2,320	33,551	620
Superior, Minnesota	Forest Service	24	1,983	432	2,415	2,981	112,993	2,195
	Forest Service	13	246	211	457	127	72,832	1,864
	Chequamegon, Wisconsin	8	2,352	210	2,562	4,377	163,570	3,017
Hoolet, Wisconsin	Forest Service	2	-	1,150	1,150	1,630	44,799	104
	Bureau-State	10	425	275	700	2,155	761	9
	Forest Service	85	9,619	4,241	13,860	22,690	500,908	6,462
Total, All Workings			95	10,044	4,516	24,845	501,669	6,471

Text Table 7. Status of Control on National Forests, North Central Region,
on December 31, 1949 Net Acres

National Forest	Total Control Problem, Acres				Acres Initially Worked				Acres Not Initially Worked				Acres On Maintenance		Percent	
	Natural Planted		Total Control		Natural Planted		Total Control		Natural Planted		Total Control		White Control		White Pine	
	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	W. P.	White Pine	Area	Init.	On Main.
Hoosier	-	18	18	179	-	18	18	179	-	6	-	18	179	100.0	100.0	100.0
Wayne	-	520	520	4,341	-	514	514	4,029	6	312	514	4,029	98.8	98.8	98.8	98.8
Huron	517	1,336	1,853	6,293	502	1,336	1,838	6,263	15	30	1,039	4,246	99.1	99.1	99.1	99.1
Manistee	2,369	20,251	22,620	70,430	2,369	20,251	22,620	70,430	-	-	21,735	67,965	100.0	100.0	100.0	100.0
Marquette	6,658	4,981	11,639	25,710	6,658	4,981	11,639	25,710	-	-	5,647	13,395	100.0	100.0	100.0	100.0
Hawatha	10,710	2,729	13,439	36,181	10,112	2,729	12,841	34,381	598	1,800	5,808	17,923	95.6	95.6	95.6	95.6
Ottawa	7,790	3,964	11,754	23,348	7,545	3,793	11,338	22,083	416	1,265	3,640	7,300	96.5	96.5	96.5	96.5
Superior	70,697	3,824	74,521	116,899	24,954	3,824	28,778	38,923	45,743	77,976	8,289	11,849	38.6	38.6	38.6	38.6
Chippewa	11,438	1,745	13,183	26,566	9,242	1,745	10,987	21,837	2,196	4,729	8,349	15,700	83.3	83.3	83.3	83.3
Chequamegon	16,725	4,299	21,024	41,370	15,786	4,299	20,085	34,387	939	6,983	10,193	18,296	95.5	95.5	95.5	95.5
Nicolet	5,993	6,393	12,386	24,410	5,898	6,393	12,291	24,125	95	285	4,555	9,960	99.2	99.2	99.2	99.2
Region Total	132,897	50,060	182,957	375,727	87,066	49,883	132,949	282,347	50,008	93,380	69,737	170,812	72.7	72.7	72.7	72.7

Text Table 8. Summary of Local Control Performed on National Forests, North Central Region, from Inception to December 31, 1949, All Agencies. Gross Acres

National Forest	Gross Acres W. P. Protected	Gross Acres Worked	Number of Ribes Destroyed	Total Man-Days Used	Average per Acre Worked	
					Ribes	Man-Days
			Initial Working			
Shawnee, Illinois	1	50	0	0	0.0	0.00
Hoosier, Indiana	18	179	0	3	0.0	0.02
Wayne, Ohio	514	4,029	56	13	Trace	0.01
Huron, Michigan	1,967	6,856	64,687	520	9.4	0.07
Manistee, Michigan	22,290	70,432	174,615	1,463	2.5	0.02
Marquette, Michigan	11,150	27,487	856,164	7,358	31.1	0.27
Hiawatha, Michigan	10,026	31,651	679,964	5,454	21.5	0.17
Ottawa, Michigan	14,415	29,425	4,257,407	16,804	144.7	0.57
Superior, Minnesota	29,151	46,553	6,325,553	29,655	135.9	0.64
Chippewa, Minnesota	14,785	37,247	3,214,926	14,202	86.3	0.38
Chequamegon, Wisconsin	16,933	39,872	2,663,575	16,772	66.8	0.42
Nicolet, Wisconsin	12,472	29,433	2,282,406	14,303	77.5	0.49
Total Initial Working	133,722	323,214	20,519,353	106,547	63.5	0.33
			Second Working			
Huron, Michigan	737	2,138	27,282	172	12.8	0.08
Manistee, Michigan	4,620	14,734	16,378	206	1.1	0.01
Marquette, Michigan	6,502	14,035	134,630	2,541	9.6	0.18
Hiawatha, Michigan	6,641	16,481	112,870	1,663	6.8	0.10
Ottawa, Michigan	9,413	17,322	808,668	5,983	46.7	0.35
Superior, Minnesota	11,997	16,541	1,154,059	9,280	69.8	0.56
Chippewa, Minnesota	4,961	10,341	314,575	2,851	30.4	0.28
Chequamegon, Wisconsin	17,013	29,613	680,423	8,590	23.0	0.29
Nicolet, Wisconsin	9,931	18,701	351,966	4,338	18.8	0.23
Total Second Working	71,815	139,906	3,600,851	35,624	25.7	0.25

Text Table 8. (Cont'd.) Summary of Local Control Performed on National Forests, North Central Region, from Inception to December 31, 1949, All Agencies. Gross Acres

National Forest	Gross Acres W. P. Protected	Gross Acres Worked	Number of Ribes Destroyed	Total Man-Days Used	Average per Acre Worked	
					Ribes	Man-Days
Third and Other Workings						
Huron, Michigan	8	128	464	5	3.6	0.04
Manistee, Michigan	1,653	5,458	7,500	91	1.4	0.02
Marquette, Michigan	4,765	8,400	30,688	665	3.7	0.08
Hiawatha, Michigan	1,582	3,590	13,463	279	3.8	0.08
Ottawa, Michigan	5,055	9,045	133,011	2,454	14.7	0.27
Superior, Minnesota	5,268	9,528	287,884	3,683	30.2	0.39
Chippewa, Minnesota	1,673	2,217	85,872	450	38.7	0.20
Chequamegon, Wisconsin	3,317	5,243	176,995	2,333	33.8	0.44
Nicolet, Wisconsin	2,044	3,290	76,781	1,203	23.3	0.37
Total Third & Other Workings	25,365	46,899	812,650	11,163	17.3	0.24
All Workings						
Shawnee, Illinois	1	50	0	0	0.0	0.00
Hoosier, Indiana	18	179	0	3	0.0	0.02
Wayne, Ohio	514	4,029	56	13	Trace	0.01
Huron, Michigan	2,712	9,122	92,433	697	10.1	0.08
Manistee, Michigan	28,563	90,624	198,493	1,760	2.2	0.02
Marquette, Michigan	22,417	49,922	1,021,482	10,564	20.5	0.21
Hiawatha, Michigan	18,249	51,722	806,297	7,396	15.6	0.14
Ottawa, Michigan	28,883	55,792	5,199,086	25,241	93.2	0.45
Superior, Minnesota	46,416	72,622	7,767,496	42,618	107.0	0.59
Chippewa, Minnesota	21,419	49,805	3,615,373	17,503	72.6	0.35
Chequamegon, Wisconsin	37,263	74,728	3,520,993	27,695	47.1	0.37
Nicolet, Wisconsin	24,447	51,424	2,711,153	19,844	52.7	0.39
Total All Workings	230,902	510,019	24,922,862	153,334	48.9	0.30

Table 9. Summary of Ribes Eradication All Workings, by National Forests and Operating Agencies, North Central Region, from Inception to December 31, 1949. Gross Acres

Forest	Operating Agency	Gross Acres Worked	Ribes Destroyed	Man-Days Used	Per Acre	
					Ribes	Man-Days
Shawnee, Ill.	Bureau-State	50	0	0	0.0	0.00
Spencer, Ind.	Bureau-State	179	0	3	0.0	0.02
Wayne, Ohio	Bureau-State	1,029	56	15	Trace	0.01
Guron, Mich.	Bureau-State	2,835	106	19	Trace	0.01
	Forest Service	6,287	92,327	678	14.7	0.12
	Total	9,122	92,433	697	10.1	0.08
Manistee, Mich.	Bureau-State	56,745	36,897	698	0.7	0.01
	Bureau-Interm.	365	1,586	19	4.3	0.05
	Forest Service	33,514	160,010	1,043	4.8	0.03
Marquette, Mich.	Total	90,624	198,493	1,760	2.2	0.02
	Bureau-State	4,045	203,236	1,085	50.2	0.27
	Forest Service	45,877	818,246	9,479	17.8	0.21
Mawatha, Mich.	Total	49,922	1,021,482	10,564	20.5	0.21
	Bureau-State	7,445	230,751	762	31.0	0.10
	Forest Service	44,277	575,546	6,634	13.0	0.15
Ottawa, Mich.	Total	51,722	806,297	7,396	15.6	0.14
	Bureau-State	3,735	353,341	1,171	94.6	0.31
	Bureau-Interm.	1,173	83,810	414	71.4	0.35
Superior, Minn.	Forest Service	50,884	4,761,935	23,656	93.6	0.46
	Total	55,792	5,199,086	25,241	93.2	0.45
	Bureau-State	6,507	1,479,097	4,518	227.3	0.69
Chippewa, Minn.	Forest Service	66,115	6,288,399	38,100	95.1	0.58
	Total	72,622	7,767,496	42,618	107.0	0.59
	Bureau-State	14,348	936,406	2,607	65.3	0.18
Chequamegon, Wis.	Forest Service	35,457	2,678,967	14,896	75.6	0.42
	Total	49,805	3,615,373	17,493	72.6	0.35
	Bureau-State	11,277	247,261	1,252	21.9	0.11
Nicolet, Wis.	Bureau-Interm.	8,853	161,999	2,180	18.3	0.25
	Forest Service	54,598	3,111,733	24,263	57.0	0.44
	Total	74,728	3,520,993	27,695	47.1	0.37
Region	Bureau-State	8,279	256,292	1,742	31.0	0.21
	Bureau-Interm.	873	7,427	147	8.5	0.17
	Forest Service	42,272	2,447,434	17,955	57.9	0.42
Region Total	Total	51,424	2,711,153	19,844	52.7	0.39
	Bureau-State	119,474	3,743,443	13,870	31.3	0.12
	Bureau-Interm.	11,264	254,822	2,760	22.6	0.25
Region Total	Forest Service	379,281	20,934,597	136,704	55.2	0.36
	Total	510,019	24,932,862	153,334	48.9	0.30

Text Table 10. Forest Service (3104 and 74) Funds Spent on Blister Rust Control, North Central Region, Calendar Year 1949

National Forest	Forest Service Regular Funds
Huron, Michigan	\$138.00
Manistee, Michigan	1,542.24
Marquette, Michigan	6,469.21
Hiawatha, Michigan	none
Ottawa, Michigan	9,183.73
Superior, Minnesota	42,603.15
Chippewa, Minnesota	7,504.52
Chequamegon, Wisconsin	19,015.40
Nicolet, Wisconsin	5,163.09
Region Total	\$91,619.34

C H A R T 9

Status of Control at End of Each Year as Shown

FOREST SERVICE LANDS - NORTH CENTRAL REGION

(Net Acres)

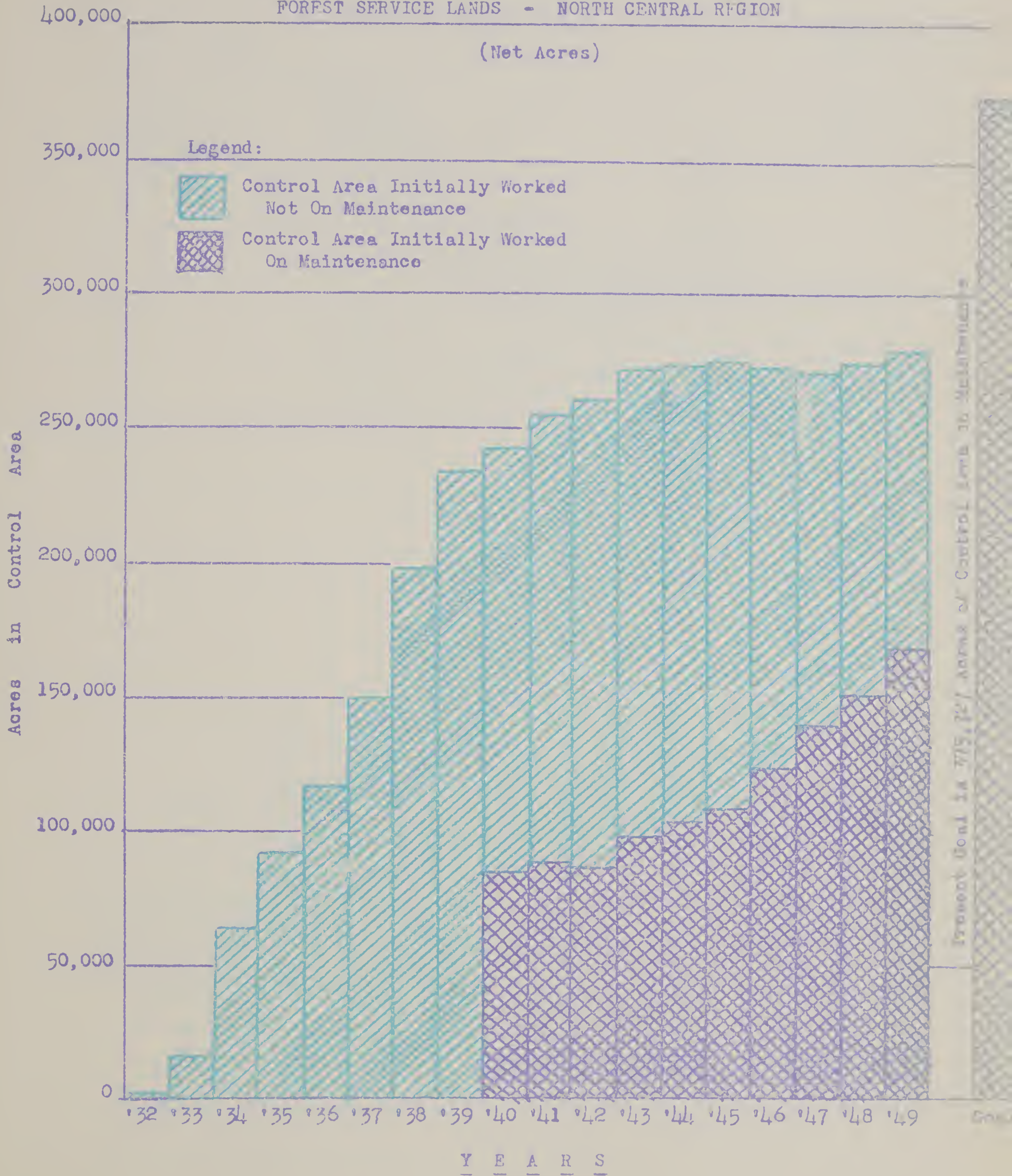


CHART 10

Status of Control Work on National Forests
(Based on Text Table 7)

NORTH CENTRAL REGION

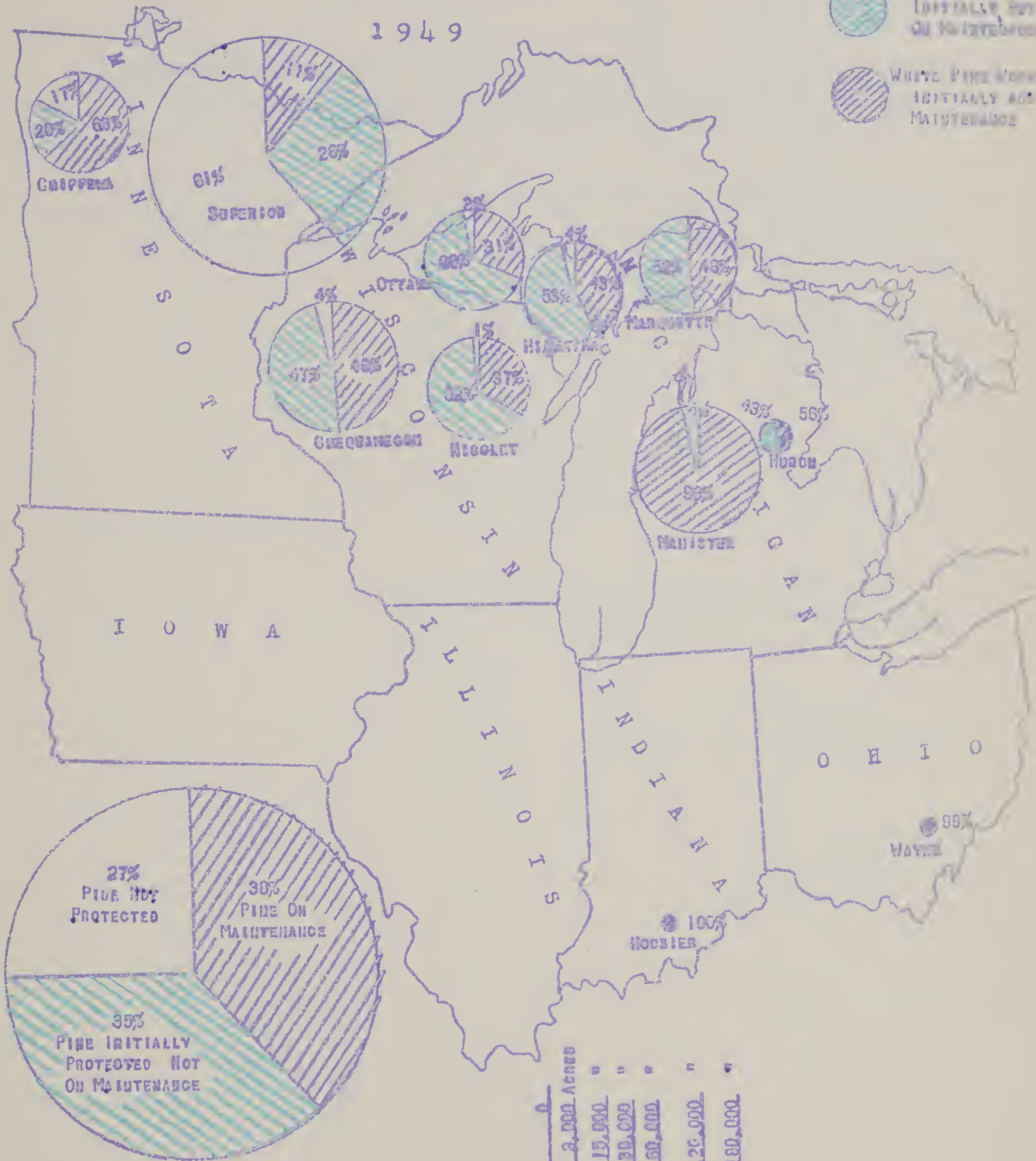
1949

LEGEND

WHITE PINE NOT PROTECTED

WHITE PINE WORKS INITIALLY BUT NOT ON MAINTENANCE

WHITE PINE WORKS INITIALLY AND ON MAINTENANCE



NORTH CENTRAL REGION

TOTAL WHITE PINE AREA IN

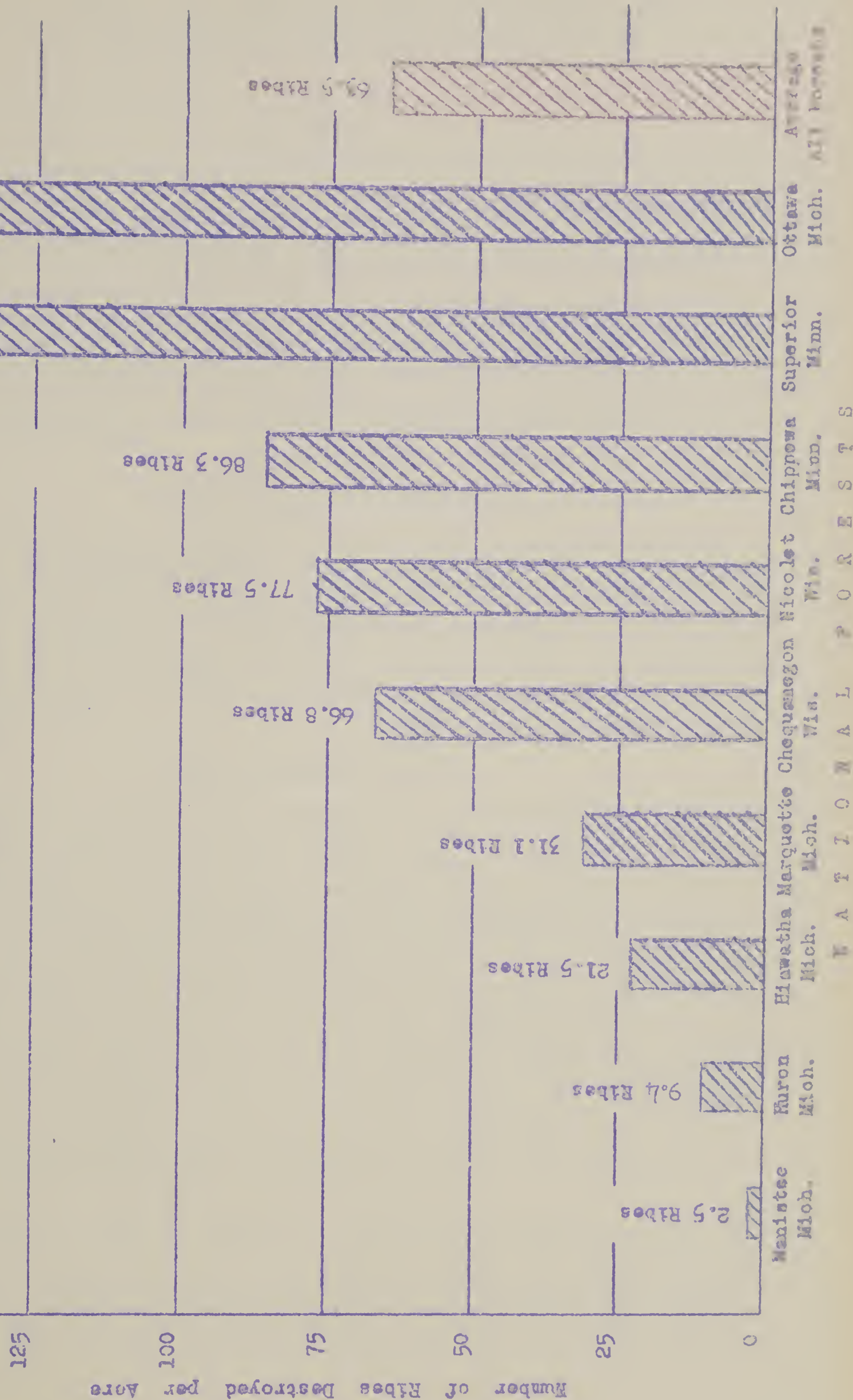
NATIONAL FOREST CONTROL PROGRAM

162,957

C H A R T 11

Ribes Destroyed per Acre, Initial Work, by National Forests,
Inception to December 31, 1949

NORTH CENTRAL REGION
(Based on Text Table 8)



BLISTER RUST CONTROL ON INDIAN RESERVATIONS, 1949

NORTH CENTRAL REGION FINANCIAL PROJECT BLR-7

Objective

The objective of the blister rust control program on Indian Reservations is to protect against blister rust all valuable white pine stands administered by the Indian Service. This involves initial and subsequent eradication of ribes from within infecting distances of white pine stands in order to bring such stands through to commercial maturity free from appreciable amounts of blister rust damage. The immediate objective is to put as many areas as possible through ribes eradication on a maintenance basis. The term "Maintenance" as used in blister rust control refers to a condition where no further ribes eradication work is believed necessary to bring the present crop of pine through to merchantable size without serious losses from blister rust.

Memorandum of Understanding

Control work on Indian Reservation lands is performed through a Memorandum of Understanding between the U. S. Indian Service and the Bureau of Entomology and Plant Quarantine. The Indian Service is responsible for selecting the pine areas to be protected and the employment of labor and supervision. The Bureau of Entomology and Plant Quarantine is responsible for the preparing of work plans and maps, training of labor and supervision, checking the adequacy of control work, keeping records, and making reports of work accomplished.

General Status of Control

There are eleven Indian Reservations in the Region that are concerned with white pine blister rust and its control. They have a total of 75,898 acres of valuable white pine in the control problem. Much of this is in the younger age classes. To assure its reaching commercial maturity, protection from blister rust must be maintained through ribes eradication. Control work performed to date has kept the disease in check so that no serious commercial damage is being suffered in protected stands. Most of the initial work has been done and areas that are now being worked for the first time are new ones that have become established either through planting or natural regeneration or old ones which were once low on the priority list but have since become first class areas through increased stocking. Rework has been kept pretty well up to schedule so that ribes which came in since the initial working have been destroyed before they became old enough to produce seed. As of December 31, 1949, 95.6 percent of all pine acreage in the present control problem has been given initial protection and 61.5 per cent is on maintenance and will require no further crew work.

There has been an increase of 3,602 acres of white pine over the 1948 figure. This increase is due to natural white pine regeneration which has been taking place on several of the Reservations in the last few years. Surveys made in 1949 included this new acreage which had not been mapped previously. Text Table 13 shows the general status of control on each of the Reservations.

Analysis of White Pine Trends on Indian Reservations

There has been a decided net increase in white pine acreage in the control problem on Indian lands during the period 1939 to 1949. As shown in the table on the following page, the net gain of 23,429 acres of white pine is made up of a gross gain of 36,681 acres, against a loss of 13,252 acres since 1939.

These trends were obtained from an analysis of survey figures. Losses and gains in acreages are shown classified as to probable reasons.

Concerning decreases, the largest single reason was overmapping, particularly on the Minnesota reservations. In the 1930's, when CCC and other emergency relief funds were largely used for control work, it was necessary to do extensive surveying and mapping to determine the extent of the control job. Later more intensive surveys resulted in more accurate maps and a reduction in acreage.

On the Menominee Reservation an adjustment of records took out duplication of areas and reduced the pine acreage.

Ribes are in general very abundant on Indian lands. Several pine areas were removed from the control problem after 1939 because they contained so many ribes it was deemed not economical to remove them. It is probable these areas could well be classed with "Blister Rust Damage" areas.

It is significant that in spite of the general prevalence of ribes and early appearance of rust on reservations only 277 acres, all on the Menominee, were thrown out because of blister rust damage. Timely and effective ribes eradication by the Indian Service was responsible for preventing a very much greater blister rust loss.

The finding of natural reproduction coming in during the wet cycle since 1937 was chiefly responsible for the addition of acreages of white pine since 1939. Nearly all of this acreage increase, 22,238 acres, was on the Wisconsin reservations. The effect of the wet cycle in bringing in new white pine reproduction is further emphasized in the 7,445 acres of previously known areas, all in Wisconsin, on which white pine stocking had improved.

Another classification of areas found between 1939 and 1949 are those containing saplings and larger trees. These were present before 1939, but were not found until more intensive surveys were made. Most of this acreage also was in Wisconsin.

Net changes were greatest in the Wisconsin reservations, particularly those of the Great Lakes Agency. Net increases in the Wisconsin reservations were from 27,984 acres in 1939, to 54,036 acres in 1949, or nearly double those in 1939. White Pine acreage changes in Minnesota were much less. There was a slight reduction in acreage, with the largest loss occurring on the Grand Portage Reservation.

While increases in pine acreage may be expected in the future, due to more pine coming to seed bearing, such increases will not occur at the same rate as in the past 10 years, because intensive mapping has practically caught up with existing acreages.

Changes in White Pine Acres in Control Problem 1939 to 1949
Indian Reservations, North Central Region

Item	Indian Reservations										Total
	Sao- Fox Iowa	Bad River Wis.	LacCourt Oreilles Wis.	Lac-du- Flambeau Wis.	Menom- inee Wis.	Grand Portage Wis.	Nett Lake Minn.	Leech Lake Minn.	White Earth Minn.	Vermil- ion Minn.	Red Lake Minn.
W.P. Acres in Control Problem 1939	10	3,959	2,518	1,956	19,551	2,245	5,775	2,562	502	72	13,319
Acres Decrease due to:											
Adjusting of Records	-	-	-	-	3,876	-	-	-	-	-	3,876
Overmapping	-	550	-	-	607	1,291	2,751	130	65	-	6,263
Logging	-	529	58	-	110	-	-	-	-	-	951
Too Many Ribes	-	367	-	-	-	224	508	-	-	-	1,099
Plantation Failures	-	13	-	-	86	-	-	-	-	-	171
Pl. Sites not Planted	-	-	136	-	-	-	-	-	43	-	179
Fires	-	-	-	-	120	-	-	-	-	-	120
Browse Damage	-	-	-	-	-	-	-	-	-	-	316
Blister Rust Damage	-	-	-	-	277	-	-	-	-	-	277
Total Decrease	-	1,459	194	-	5,976	1,515	3,259	130	103	-	13,352
Acres Retained:											
Essentially Unchanged	10	2,160	1,871	1,456	8,323	730	2,516	2,432	394	72	11,808
With Better Stocking	-	340	453	500	6,152	-	-	-	-	-	7,445
Total Acres Retained	10	2,500	2,324	1,956	14,475	730	2,516	2,432	394	72	13,253
Acres Increase due to:											
Natural Reproduction	-	132	9,069	8,506	4,531	-	15	-	26	-	22,599
New Plantations	35	13	-	46	10	-	86	-	-	-	190
Saplings and Larger	-	5,645	2,410	867	1,552	103	10	-	-	-	10,587
Better Surveys	-	-	-	-	-	111	2,600	-	82	6	3,305
Total Increase	35	5,790	11,479	8,552	6,093	214	2,711	-	108	6	36,681
White Pine Acres in Control Problem 1949	45	8,290	13,803	11,375	20,568	974	5,227	2,432	502	78	75,894

Rust Conditions

In general, ribes are more abundant on Indian Reservation lands than the average. Also most of the Reservations are located in the northern part of the Region where climate conditions favor the spread of the rust. Infection on pine is common in unprotected stands in the North. Yet there is comparatively little damage in the protected stands on the Reservations. The fact that such a high proportion of Indian white pine forests has been initially worked, and the absence of serious damage to these white pines from blister rust, speaks very well for the effective manner in which the Indian Service has performed blister rust control.

There was nothing unusual about the amount of rust found on ribes in 1949. The season seems to have been a normal one with long dry spells in some parts of the Region and cool moist periods in others, but no general climatic condition which could be said to either favor or hinder the spread of the rust. Nor were there any startling discoveries of rust on pine in any of the Reservations, just the usual insidious intensification in unprotected stands. Examinations made during the year confirmed the earlier observation that the years 1944 and 1945 had been especially favorable for pine infection, especially in Minnesota.

Control Work in 1949

Local control work was performed on 7 of the 11 Reservations, or on all but the Sac-Fox, Grand Portage, Leech Lake and White Earth Reservations. As noted in Text Table 11, 19,694 acres of control area was cleared of 805,750 ribes to protect 11,596 acres of pine at a cost of 7,637 man-days. One fifth of the man-days used were on initial eradication and four fifths on rework. The proportion of reeradication work being done compared to initial work is a good index of progress being made in catching up on the control problem. The more reeradication the better the progress. It indicates that after worthwhile new areas are taken care of initially sufficient funds are left to rework other valuable areas before ribes become reestablished in them. There will always be some initial work each year because of new white pine areas coming in through natural reproduction or planting. The amount of reeradication to be done will diminish as more areas are put on a maintenance basis.

That good progress in local control was made in 1949 is evidenced by the fact that in spite of adding 3,602 acres of white pine to the control problem, the percentage of pine initially protected was raised from 93 in 1948 to 95.6 in 1949 and acreage placed on maintenance from 48 to 61.5 per cent.

All control work done in 1949 was performed on the basis of plans agreed upon by the Indian Service and the Blister Rust Control Organization. Indian labor was used entirely. Direct supervision was also provided by the Indian Service through the employment of technically trained men assigned to supervise the work on one or more Reservations. The Bureau of Entomology and Plant Quarantine provided overall technical direction, checked on adequacy of control work and assisted in training crews, mapping, keeping records and preparing the necessary reports.

All but 6 of the 95 areas worked in 1949 were given a formal check. It was found that 99.7 percent of the acreage worked and checked contained less than 25 feet of ribes live stem per acre remaining after working; a very commendable showing of quality work performed.

The six areas with 1,208 acres worked on the Nett Lake and Red Lake Reservations in Minnesota were only checked administratively as the work progressed and appeared to be satisfactory. However a formal check must be made in the spring of 1950 to make sure that these areas also pass the standards of quality required to declare the areas safe.

Generally speaking, the 1949 eradication season on the Indian Reservations was a very successful one and followed quite closely the work plans that were prepared and approved in advance.

Expenditures in 1949

Expenditures for ribes eradication by Indian Reservations and sources of funds for 1949 are shown in Text Table 15. Regular Indian Service (3107 and 77) funds were spent on seven reservations in the total amount of \$61,809.57. In addition \$6,584.12 of Menominee Indian Tribal funds were used in local control, making a total of \$68,393.69 furnished by the Indian Service. The Bureau of Entomology and Plant Quarantine provided additional funds for mapping, surveying, checking, technical supervision and keeping of records, as its part of its responsibilities towards the control program on Indian Service lands.

Work Plans For 1950

On the basis of surveys made in 1949 the following work schedule is suggested for 1950. As has been the custom in the past it is hoped that representatives of the Indian Service can accompany Bureau men into the field to check and pass on the desirability of working the proposed areas well in advance. Because of especially heavy ribes concentrations on the Grand Portage and Nett Lake Reservations, the cost of eradication work on them will be unusually high. Therefore it is doubly important that the Indian Service determine for itself which areas it considers worth the protection costs involved.

Areas in Need of Work in 1950

Reservation	No. Areas	Acres Pine to be Protected	Acres to Work	Estimated Man-days needed
Grand Portage	7	175	340	702
Nett Lake	2	54	148	150
Red Lake	7	332	834	525
Bad River	3	1,074	1,903	857
Lac Court Oreilles	7	2,692	4,094	1,447
Lac du Flambeau	5	869	1,612	196
Menominee	10	2,160	3,935	1,780
Total	41	7,356	12,866	5,657

In addition to the above it is quite likely that rework is due on the Sac-Fox Reservation in Iowa. This Reservation contains 45 acres of planted pine with 500 acres of control area. It was last worked in 1944 when 57 man-days were used on rework. It is suggested that 60 man-days of Indian labor be provided for work there in 1950.

It is recommended that the same effective cooperation and coordination of effort between the Indian Service and the Bureau be continued as it has in the past. It has produced good results by bringing the control program on all Reservations up to schedule and preventing serious losses from blister rust. Specifically this cooperation includes the joint preparation of work plans based on field surveys, discussing and evaluating pine areas by representatives of both agencies together on the ground, and joint consultation in the preparation of budgets. It also includes hiring and supervising of labor by the Indian Service and making of final checks on the work by the Bureau.

A brief discussion of the work on each Indian Reservation follows. A more detailed account can be found in the separate report for each Reservation.

Sac-Fox Indian Reservation - Iowa

The Sac-Fox Indian Reservation located approximately in the center of the State of Iowa has 45 acres of planted pine with a control area of 500 acres. All of it has been initially protected and some of it was reworked in 1944 when 14,074 ribes were destroyed. No work has been done since 1944. A brief inspection made in the fall of 1949 showed that ribes are coming back. The white pine is making excellent growth on this Reservation. Annual height growths of from three to four feet are not uncommon.

No blister rust infection has been found on the Reservation. Ribes infection, however has been found in Tama county. It is recommended that 60 man-days of Indian labor be provided to rework the entire 500 acres of control areas in 1950.

Grand Portage Indian Reservation - Minnesota

The Grand Portage Indian Reservation has 974 acres of natural white pine included in its 1,271 acres of control area. All of it has been given initial protection and the necessary rework when due. None of it however, is on maintenance. Blister rust infection on pine occurs in limited amounts throughout the protected area. Contrasted to the severe pine infection that is found in neighboring territory, especially on the Canadian side where no control work has been done, the small amount of infection found on the Reservation is good proof of the effectiveness of blister rust control. The abundance of ribes, the topography and the Lake Superior climatic conditions all are extremely favorable for the rapid spread and development of the rust in this part of Minnesota. Therefore, special care must be exercised to keep the ribes population in the control zone down. No ribes eradication work was performed on this Reservation in 1949.

A list of proposed areas for work in 1950 includes 6 areas for second working and one for third working. A total of 340 acres of control area is involved to protect 175 acres of natural pine. Because of heavy ribes populations and rough topography a high estimate of 702 man-days is needed for ribes eradication. Only on the basis of high aesthetic value can these areas be considered worth control costs. It is strongly urged that the Indian Service and Bureau representatives get together on the ground and evaluate these areas before working them.

Leech Lake Indian Reservation - Minnesota

The Leech Lake Indian Reservation is on a large peninsula extending into Leech Lake just across the bay and north of the Village of Walker. This part of the reservation is known as the "Onigum Unit" and contains the entire white pine blister rust control area of 3,387 acres which includes 2,432 acres of white pine. Nearly half of the white pine is owned by the U. S. Forest Service. A similar amount is within the jurisdiction of the Consolidated Chippewa Indian Agency. Initial control work was performed in 1934 and rework in 1946 and 1947. Nearly all of the control area, 2,076 acres of white pine and 2,755 acres of control area, is on maintenance. No additional work is contemplated until 1954. This is one of the best stocked stands of any on the reservations.

Nett Lake Indian Reservation - Minnesota

This reservation has 5,227 acres of white pine in its control area of 7,187 acres. All but 23 acres of pine and 43 acres of control have been given initial protection. This small piece is surrounded by a muskeg swamp in the northwest part of the reservation and is quite inaccessible. Over 90 percent of the pine on the reservation is on maintenance. Logging of large jack pine in 1947 has stimulated white pine reproduction and ribes regeneration. Pine infection can be found scattered lightly throughout the protected pine on the reservation and is quite heavy in understocked unprotected stands.

Local control in 1949 consisted of reworking 361 acres of control area from which 38,717 ribes were removed at an expenditure of 531 man-days. Protection was thus maintained on 4 areas having a total of 254 acres of pine.

Checking after eradication revealed that three of the four areas had been cleaned up thoroughly. The fourth one did not pass the regional standard of 25 F.L.S. per acre and should be mopped up in the spring of 1950. This was area No. 46 located in Sec. 32, T65N, R23W.

Two areas are listed for work in 1950. One consists of 105 acres of control area to maintain protection on 31 acres of pole-sized pine in Nett Lake Village. The other is the 23 acre island of pine which has never been protected. An examination in 1949 revealed that nearly half of the trees are infected and that there is a pretty good stocking of other species mixed with the pines. Before it is decided to work this area a representative of the Indian Service should look it over to make sure that the pine values warrant an estimated expenditure of 90 man-days to protect it.

Vermilion Indian Reservation - Minnesota

The control problem on this reservation consists of 78 acres of natural pine and 186 acres of control area. Following the fifth working in 1949 the entire acreage was placed on maintenance. Only a very small amount of rust can be found on the pine. This again brings out the effectiveness of control as the area originally had a very heavy ribes population and is located where climatic conditions are very favorable for the spread of the rust.

White Earth Indian Reservation - Minnesota

The blister rust control problem on this reservation consists of 1,046 acres of control area including 502 acres of white pine.

Initial protection and rework has kept blister rust infection to a minimum with only a trace of it to be found in the protected stands. The last ribes eradication was done in 1947 which brought the control work up to date. About half the pine acreage and control area is now on maintenance. No ribes eradication work is believed necessary in 1950.

Red Lake Indian Reservation - Minnesota

The Red Lake Indian Reservation with 12,604 acres of white pine in its control problem contains over half the total white pine of all the reservations in Minnesota. The main body of white pine occurs on Pomenah Point, a peninsula projecting between Upper and Lower Red Lake. A considerable number of smaller pine areas are found immediately south of Lower Red Lake. Not included in the present control problem are two other locations of white pine, one the Pine Island Indian lands in Koochicking County and the other on the Northwest Angle. Both are off the Reservation but are administered by the Red Lake Agency. It is doubtful if either one will be included in the control problem. The Pine Island lands have about 1,000 acres of mature red and white pine but after it is logged it appears quite likely it will reproduce to balsam due to its swampy location. The Northwest Angle has sapling and pole size pine growing on a sand ridge in two interior sections. This area is quite inaccessible and can be reached only by airplane or boat from the Minnesota mainland.

The white pine on the Reservation proper is of all ages, ranging from large mature trees, now in the process of being logged, to seedlings that are coming in under the older trees. A high wind in July 1949 blew down about 4 million board feet of mature pine on Pomenah Point. This disturbance and the ensuing logging operations will very likely encourage new pine reproduction and ribes regeneration.

All of the 12,604 acres of white pine on the Reservation has been initially protected and rework has been done on a lot of it. Nearly 83 percent of the pine is on maintenance. It is expected that the rework schedule will be brought up-to-date in 1950.

Rust conditions on the Red Lake Reservation are not severe. Ribes abundance ranges all the way from very heavy in the swamps, heavy in the hardwoods, to light on the sandier soils. Logging in the area has stimulated ribes regeneration making rework necessary. Blister rust infection on pine averages from one to two percent which is still well below the safe level. Considering the ribes concentrations and the climatic conditions favorable for the spread of the rust this light infection indicates that the control measures applied and maintained have been very effective.

Local control in 1949 got under way early in spring with a crew of 30 men on Lower Red Lake and 20 men on Pomenah Point. Additional men were employed so that by June 30 a total of 70 men were engaged in the work. By the end of the eradication season the entire control acreage on Pomenah Point was placed on maintenance. Good progress was also made on Lower Red Lake but some scheduled rework still remains to be done there in 1950.

In 1949 a total of 40 areas were worked giving protection to 3,257 acres of pine by working 5,203 acres from which 354,174 ribes were removed at a cost of 3,210 man-days. Checking after eradication proved that excellent work had been done as all acreage checked was found to have less than half the allowable footage of livestock permitted after working.

The suggested work program for 1950 recommends the working of 7 areas to protect 332 acres of pine by working 834 acres of control at an estimated expenditure of 525 man-days.

Some survey work is also recommended to bring the old area maps up to date. Some of these areas were last mapped in 1935 and 1936. Aerial photos and improved survey technique will bring about a much more accurate pine inventory upon which to base future control work.

Bad River Indian Reservation - Wisconsin

There are 8,290 acres of white pine and 15,294 acres of control area within the control problem of the Bad River Reservation. All but 123 acres have been given initial protection. As of December 31, 1949, 84% of this pine has been placed on maintenance.

Blister rust infection on ribes and white pine has been found through-out the reservation, but it is very light, having less than one percent infection in protected stands. In unprotected areas of scattered pine numerous cankers are apparent on trees in ravines and along the edges of openings.

During 1949, local control work on the reservation consisted entirely of re-eradication. A crew of 19 Bad River Indians began work early in May and continued through June 14. From June 15 to September 3 five men were employed. The supervision was provided by the blister rust control supervisor employed by the Great Lakes Consolidated Indian Agency. Bureau blister rust men furnished technical advice and assistance and assumed responsibility for the quality of control work accomplished.

Five areas were worked having a total of 1,236 acres of white pine. From the 2,010 acres of control area, 155,149 ribes were removed at a cost of 741 man-days. Checking after eradication revealed that an excellent quality of work had been done. As a result all five areas were placed on maintenance.

The work plan for 1950 calls for re-eradication on three areas. This will involve working 1,903 acres of control area to maintain protection on 1,074 acres of pine at an estimated cost of 857 man-days.

Lac Court Oreilles Indian Reservation - Wisconsin

The white pine acreage on the Lac Court Oreilles has been increasing for the past several years. Surveys completed by the Agency blister rust control supervisor added another 1,289 acres of natural reproduction to the inventory of white pine this year. There are now 13,803 acres of good white pine in the control problem of the reservation. Further increases can be expected as it is estimated there are about 35,000 acres of white pine forest type on this reservation. On most of this acreage scattered white pines of seed bearing age are found. Each year there is a noticeable increase in natural reproduction.

Blister rust infection is quite generally distributed over the reservation, doing considerable damage in unprotected areas and very little in protected stands.

Ribes eradication work performed in 1949 consisted of initial and rework. Four 5-man crews were employed at the start of the season. After July 1 this force was reduced to two 5-man crews. There were 2,243 acres of white pine protected by the removal of 173,565 ribes from 4,508 acres of control area at an expenditure of 4,508 man-days.

Checking after eradication proved that very satisfactory work had been done, none exceeded 25 F.L.S. per acre after working and all but 120 acres had only half that amount.

The status of control as shown in Text Table 13, shows that 93.5 percent of the pine acreage has been given initial protection and 34.1 percent is now on maintenance. The character of ribes growth on the reservation is such that it takes two or more workings at about 5 year intervals to reduce the ribes population to a point where recurrence of the plants will not endanger the pine.

The proposed program of local control for the calendar year 1950 on the Lac Court Oreilles Indian Reservation lists 218 acres of white pine to be protected initially and 2,481 acres to be protected by rework. This will require working a total control area of 4,094 acres estimated to require 1,447 man-days.

Lac du Flambeau Indian Reservation - Wisconsin

The Lac du Flambeau Reservation like the Lac Court Oreilles has some very good white pine sites that are steadily increasing in pine acreage as new reproduction comes in.

At present there are 11,375 acres of white pine worth protecting on the reservation. Of this, 500 acres are estimated acreage of white pine found during the 1949 eradication season but not mapped at that time. To date 95.6 percent of the pine has been given initial protection and 81.9 percent is on maintenance and will require no further crew work.

Local control in 1949 was started on May 11 by a crew of five Indians who worked through June 22. They protected 2,116 acres of white pine by removing 20,853 ribes from 3,814 acres of control area at a cost of 167 man-days, a very creditable accomplishment. By far the greatest number of ribes destroyed and man-days used was on initial work which protected a lot of good white pine reproduction recently brought into the control problem. The quality of work done was very good. Checking revealed that the entire 3,814 acres worked had been satisfactorily cleared of ribes so that none of them contained over 15 F.L.S. per acre after working.

The proposed work plan for 1950 calls for the working of 1,612 acres to protect 869 acres of pine at an estimated cost of 196 man-days.

Menominee Indian Reservation - Wisconsin

The Menominee contains the largest amount of white pine of all the reservations in this Region. The pine is of all age classes ranging from large saw timber which is producing high quality lumber annually to reproduction which continues to come in on favorable white pine sites. Most of this increase is taking place on the lighter soil types east of the Wolf River where reproduction is becoming established under oak, red pine and jack pine. The quality of immature white pine areas on the Reservation appears to be much better than average. Stocking and growth is usually excellent. Except for blister rust, there has been very little damage from insect pests or other plant diseases. Browse damage is insignificant because the deer and rabbit population is kept down by year round hunting on the Reservation. Through surveys, about 1,200 acres of new white pine reproduction were mapped and included for initial protection during the year.

All ribes species indigenous to eastern Wisconsin are present on the Reservation. Distribution varies with soil and cover types, light to absent on sandy soils, medium to abundant in swamps and on the heavier soils. No white pine areas are entirely ribes free.

Blister rust infection on pine is found in every area on the Reservation. Damage is not serious however, in areas where adequate control measures have been maintained. But considerable rust damage does occur in unprotected areas, such as in scattered reproduction in hardwood types, in old fields and edges of lowland surrounded by hardwoods and in well stocked areas too small to protect.

Ribes eradication work in 1949 was started on May 3 and continued until September 9. Crew personnel consisted entirely of Indian women. Four crews averaging 6 women per crew were used throughout the season. Both initial and rework were done. A total of 2,445 acres of white pine was given protection by working 3,735 acres of control area from which 61,865 ribes were removed at an expenditure of 1,743 man days.

Systematic checking and general observation indicate that the quality of work was fair. Portions of several jobs, particularly lowland areas, failed to check below 25 feet of ribes live stem per acre and were reworked. A few small areas worked late in the season remain to be "mopped-up" next spring. While most of the ribes were uprooted some chemical spraying was also done. Dense concentrations of Ribes americanum within the protective zones of areas being worked were treated with a foliage spray of 2,4-D or a combination of 2,4,5-T. Some Ribes hirtellum were also sprayed where they were in close proximity to the black currants. Preliminary examinations indicate good kill on currants where the coverage was adequate. The spraying of dense clumps of susceptible species of ribes greatly speeds up the work and where applicable affords a considerable saving of man-days.

Of the 20,568 acres of white pine in the control problem on the Reservation 91.3 percent have been initially worked and 39.7 percent are on maintenance

Control work which remains includes the protection of 12,395 acres not on maintenance, and initial protection of areas currently restocking to white pine.

Work plans for 1951 call for the working of 3,935 acres of control areas which will require an estimated 1,780 man-days. A total of 22 men will be needed and it is felt that they can complete all scheduled work for 1950 by June 30.

Detailed figures for Surveys, Local Control, Checking, Status of Control and Costs are given in the tables immediately following.

A still more detailed account of the work on each reservation may be had by referring to the separate reports for each reservation.

Table 11. Control on Indian Reservations, All performed by Indian Employees
North Central Region, 1949

Indian Reservation	No. Areas	Acres White Pine Protected			Acres Control Area Worked	Ribes Bushes Destroyed	8 hour Men Days Used
		Natural	Planted	Total			
<u>Initial Working</u>							
Red Lake, Minn.	6	270	-	270	670	9,833	105
Lac Court Oreilles, Wis.	12	1,095	-	1,095	2,142	128,942	742
Lac du Flambeau, Wis.	11	1,046	-	1,046	2,026	20,345	155
Menominee, Wis.	8	1,515	-	1,515	2,140	20,256	534
Total, Initial Working	37	3,926	-	3,926	7,938	279,374	1,536
<u>Second Working</u>							
Nett Lake, Minn.	1	39	11	50	122	11,040	126
Red Lake, Minn.	14	816	-	816	1,539	204,211	1,182
Bad River, Wis.	5	1,236	-	1,236	2,010	155,149	744
Lac Court Oreilles, Wis.	2	343	13	356	704	33,864	86
Lac du Flambeau, Wis.	1	138	-	138	352	27	1
Menominee, Wis.	1	180	-	180	235	9,168	224
Total, Second Working	24	2,752	24	2,776	4,962	433,459	2,169
<u>Third and Other Workings</u>							
Vermilion, Minn.	2	45	-	45	63	1,427	67
Nett Lake, Minn.	3	202	2	204	239	27,677	405
Red Lake, Minn.	20	2,143	28	2,171	2,994	140,132	1,923
Lac Court Oreilles, Wis.	2	538	254	792	1,662	10,759	347
Lac du Flambeau, Wis.	1	932	-	932	1,436	481	11
Menominee, Wis.	4	750	-	750	1,100	32,441	985
Total, Third and Other Workings	32	4,610	284	4,894	7,454	212,937	3,734
<u>All Workings</u>							
Vermilion, Minn.	2	45	-	45	63	1,427	67
Nett Lake, Minn.	4	241	13	254	361	38,717	531
Red Lake, Minn.	40	3,229	28	3,257	5,203	354,174	3,210
Bad River, Wis.	5	1,236	-	1,236	2,010	155,149	744
Lac Court Oreilles, Wis.	16	1,976	267	2,243	4,508	173,565	1,175
Lac du Flambeau, Wis.	13	2,116	-	2,116	3,814	20,853	167
Menominee, Wis.	13	2,445	-	2,445	3,735	61,865	1,743
Region Total, All Workings	93	11,288	308	11,596	19,694	805,750	7,637

Text Table 12. Results of Checking After Ribes Eradication on Indian Reservations,
North Central Region, 1949

Indian Reservation	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre After Working				Percent Acreage with 25 FLS or Per Acre Working
	No. Areas	Strip Acres	Ribes Bushes	Found F.L.S.	Ribes per Acre Bushes F.L.S.	0.0 - 15.0		15.1 - 25.0 Over 25.0	
						FLS (Acres)	FLS (Acres)		
Vermilion, Minnesota	2	63	4	10.5	3.0	8.0	63	-	100.0
Nett Lake, Minnesota	4	361	42	61.7	4.9	7.2	344	17	95.3
Red Lake, Minnesota	39	5,193	842	1,296.5	5.9	9.1	4,082	36	99.3
Bad River, Wisconsin	5	2,020	87	92.0	5.1	5.4	2,010	-	100.0
Lac Court Oreilles, Wisconsin	14	4,340	125	228.0	3.5	6.3	4,220	-	100.0
Lac du Flambeau, Wisconsin	13	3,814	0	0.0	0.0	0.0	3,814	-	100.0
Menominee, Wisconsin	10	2,705	163	308.5	2.4	4.5	2,705	-	100.0
Region Total	87	18,426	1,268	1,997.2	3.6	5.7	17,238	53	99.7

Note: In 1949 there were 6 areas with 1,208 acres worked but not given a formal check. However, some of these were checked administratively and found satisfactory.

Text Table 13. Status of Control on Indian Reservations, North Central Region, on December 31, 1949

Indian Reservation	Total Control Problem, Acres			Acres Initially Worked			Acres Not Initially Worked			Acres On Maintenance		Percent Initially Worked on Maintenance	
	White Pine			White Pine			White Pine			White Pine		White Pine	
	Natural	Planted	Total	Natural	Planted	Total	Natural	Planted	Total	Control Area	White Pine Area	ally Worked	on Maintenance
<u>Iowa</u>													
Sac-Fox	45	45	90	45	45	90	45	45	90	45	45	100.0	0.0
<u>Minnesota</u>													
Grand	974	974	1,948	974	974	1,948	974	974	1,948	974	974	100.0	0.0
Portage	2,432	2,432	4,864	2,432	2,432	4,864	2,432	2,432	4,864	2,432	2,432	100.0	85.4
Leech Lake	5,085	142	5,227	5,062	142	5,204	5,062	142	5,204	7,384	6,238	99.6	91.3
Nett Lake	78	78	156	78	78	156	78	78	156	186	186	100.0	100.0
Vermilion	502	502	1,004	502	502	1,004	502	502	1,004	1,056	545	100.0	46.0
White Earth	12,417	187	12,604	12,417	187	12,604	12,417	187	12,604	19,145	14,724	100.0	82.9
Red Lake	329	329	658	329	329	658	329	329	658	329	329	100.0	80.7
Total, Minn.	21,488	21,488	42,976	21,465	329	21,794	21,465	329	21,794	32,129	24,448	99.9	80.7
<u>Wisconsin</u>													
Bad River	8,290	-	8,290	8,167	-	8,167	8,167	-	8,167	14,271	11,654	98.5	83.4
Lac Court Oreilles	13,429	374	13,803	12,531	374	12,905	12,531	374	12,905	23,202	9,210	93.5	34.1
Lac du Flambeau	11,329	46	11,375	10,829	46	10,875	10,829	46	10,875	20,351	18,068	95.6	81.9
Menominee	20,316	252	20,568	18,533	252	18,785	18,533	252	18,785	31,742	13,270	91.3	39.7
Total, Wis.	53,364	672	54,036	50,060	672	50,732	50,060	672	50,732	89,566	52,202	93.9	52.9
Region Total	74,852	1,046	75,898	71,525	1,046	72,571	71,525	1,046	72,571	122,195	76,650	95.6	61.3

Test Table 14. Summary of Local Control Performed on Indian Reservations,
North Central Region, From Inception to December 31, 1949,
Work Done by Indian Service Except as Noted. Gross Acres

Indian Reservation	Acres White Pine Protected	Acres Worked	Ribes Destroyed	8-Hour Man- Days Used	Average Per Acre Worked	
					Ribes	Man- Days
<u>Initial Working</u>						
Sac-Fox, Iowa	45	500	13,462	169	26.9	0.34
Grand Portage, Minn.	1,012	1,620	2,367,154	4,525	1,461.2	2.79
Leech Lake, Minn. (a)	2,562	3,323	378,885	1,007	114.0	0.30
Nett Lake, Minn.	4,497	7,126	527,722	1,841	74.1	0.26
Vermilion, Minn.	72	286	137,530	424	480.9	1.49
White Earth, Minn. (b)	466	1,354	398,705	1,178	294.5	0.87
Red Lake, Minn.	13,444	20,838	6,750,239	11,321	323.9	0.54
Bad River, Wis.	7,514	14,673	8,216,882	18,888	560.0	1.29
Lac Court Oreilles, Wis.	9,916	19,564	1,542,673	11,343	78.9	0.56
Lac du Flambeau, Wis.	10,341	20,448	766,676	4,301	37.5	0.21
Menominee, Wis.	23,644	39,337	10,317,015	34,857	262.3	0.89
Total, Initial Working	73,513	129,069	31,416,943	89,854	243.4	0.70

Includes work done on
Bureau-State funds as follows:

(a) Leech Lake, Minn.	-	1,675	52,533	275	31.4	0.16
(b) White Earth, Minn.	-	982	252,747	693	257.4	0.71
Total Bureau-State Funds	-	2,657	305,280	968	114.9	0.36

Second Working

Sac-Fox, Iowa	10	206	3,592	57	17.4	0.28
Grand Portage, Minn.	469	651	289,501	1,064	444.7	1.60
Leech Lake, Minn. (c)	2,288	3,012	197,460	831	65.6	0.28
Nett Lake, Minn.	3,103	3,611	321,890	2,604	89.1	0.72
Vermilion, Minn.	72	206	29,912	210	145.2	1.02
White Earth, Minn.	481	918	204,927	673	223.2	0.73
Red Lake, Minn.	12,138	18,370	1,728,722	7,427	94.1	0.60
Bad River, Wis.	4,379	8,095	1,371,517	5,735	169.4	0.71
Lac Court Oreilles, Wis.	3,797	7,517	424,485	2,795	56.5	0.37
Lac du Flambeau, Wis.	2,218	6,384	46,470	371	7.3	0.06
Menominee, Wis.	10,045	17,597	1,702,695	13,936	96.8	0.79
Total, Second Working	39,000	66,567	6,321,171	35,703	95.0	0.54

Includes work done on
Bureau-State Funds as follows:

(c) Leech Lake, Minn.	-	632	44,189	211	69.9	0.33
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Text Table 14. (Cont'd) Summary of Local Control Performed on Indian Reservations, North Central Region, from Inception to December 31, 1949. Work Done by Indian Service Except as Noted. Gross Acres

Indian Reservation	Acres White Pine Protected	Acres Worked	Ribes Destroyed	8-Hour Man- Days Used	Average Per Acre Worked Man- Days	
Third and Other Workings						
Grand Portage, Minn.	208	275	43,546	267	158.3	0.97
Leech Lake, Minn.	365	502	90,689	376	180.7	0.75
Nett Lake, Minn.	1,422	1,655	191,757	1,735	115.9	1.05
Vermilion, Minn.	195	435	41,679	485	95.8	1.11
White Earth, Minn.	453	808	134,029	543	165.9	0.67
Red Lake, Minn.	11,091	15,817	1,268,717	7,974	80.2	0.50
Bad River, Wis.	2,529	3,994	541,738	2,397	135.6	0.60
Lac Court Oreilles, Wis.	1,005	3,000	16,431	571	5.5	0.19
Lac du Flambeau, Wis.	932	1,436	481	11	0.3	0.01
Menominee, Wis.	3,352	5,796	175,698	3,604	20.3	0.62
Total Third and Other Workings	21,552	33,718	2,504,765	17,963	74.3	0.53

<u>All Workings</u>						
Sac-Fox, Iowa	55	706	17,054	226	24.2	0.32
Grand Portage, Minn.	1,689	2,546	2,700,201	5,856	1,060.6	2.30
Leech Lake, Minn. (d)	5,215	6,837	667,034	2,214	97.6	0.32
Nett Lake, Minn.	9,022	12,392	1,041,369	6,180	84.0	0.50
Vermilion, Minn.	339	927	209,121	1,119	225.6	1.21
White Earth, Minn. (e)	1,400	3,080	737,661	2,394	239.5	0.78
Red Lake, Minn.	36,673	55,025	9,747,678	26,722	177.1	0.49
Bad River, Wis.	14,422	26,762	10,130,137	27,020	378.5	1.01
Lac Court Oreilles, Wis.	14,718	30,081	1,983,589	14,709	65.9	0.49
Lac du Flambeau, Wis.	13,491	28,268	813,627	4,683	28.8	0.17
Menominee, Wis.	37,041	62,730	12,195,408	52,397	194.4	0.84
Total, All Workings	134,065	229,354	40,242,879	143,520	175.5	0.63

Includes work done on
Bureau-State Funds:

(d) Leech Lake, Minn.	-	2,307	96,722	486	41.9	0.21
(e) White Earth, Minn.	-	982	252,747	693	257.4	0.71
Total, Bureau-State funds	-	3,289	349,469	1,179	106.3	0.36

Text Table 15. Indian Service Funds Spent on Blister Rust Control
North Central Region, Calendar Year 1949

Agency	Reservation	F. Y. 1949 Jan. - June 1949	F. Y. 1950 July - Dec. 1949	Total Calendar Year 1949
Consolidated Chippewa, Minnesota	Grand Portage	\$711.94	\$460.00	\$1,171.94
	Nett Lake	5,188.49	1,040.00	6,228.49
	Vermilion	554.95	-	554.95
	Sub-Total	6,455.38	1,500.00	7,955.38
Red Lake, Minnesota	Red Lake	15,433.00	9,482.00	24,915.00
Great Lakes, Wisconsin	Bad River	3,943.83	2,337.20	6,281.03
	Lac Court Oreilles	8,576.35	4,703.34	13,279.69
	Lac du Flambeau	2,742.00	-	2,742.00
	Sub-Total	15,262.18	7,040.54	22,302.72
Menominee, Wisconsin	Menominee, I. S.	2,983.22	3,653.25	6,636.47
	Tribal Funds	2,983.22	3,600.90	6,584.12
	Sub-Total	5,966.44	7,254.15	13,220.59
Region	Indian Service			
	Funds	40,133.78	21,675.79	61,809.57
	Tribal Funds	2,983.22	3,600.90	6,584.12
Region Total		43,117.00	25,276.69	68,393.69

C H A R T 12

Status of Control at End of Each Year as Shown

INDIAN SERVICE LANDS - NORTH CENTRAL REGION

Net Acres

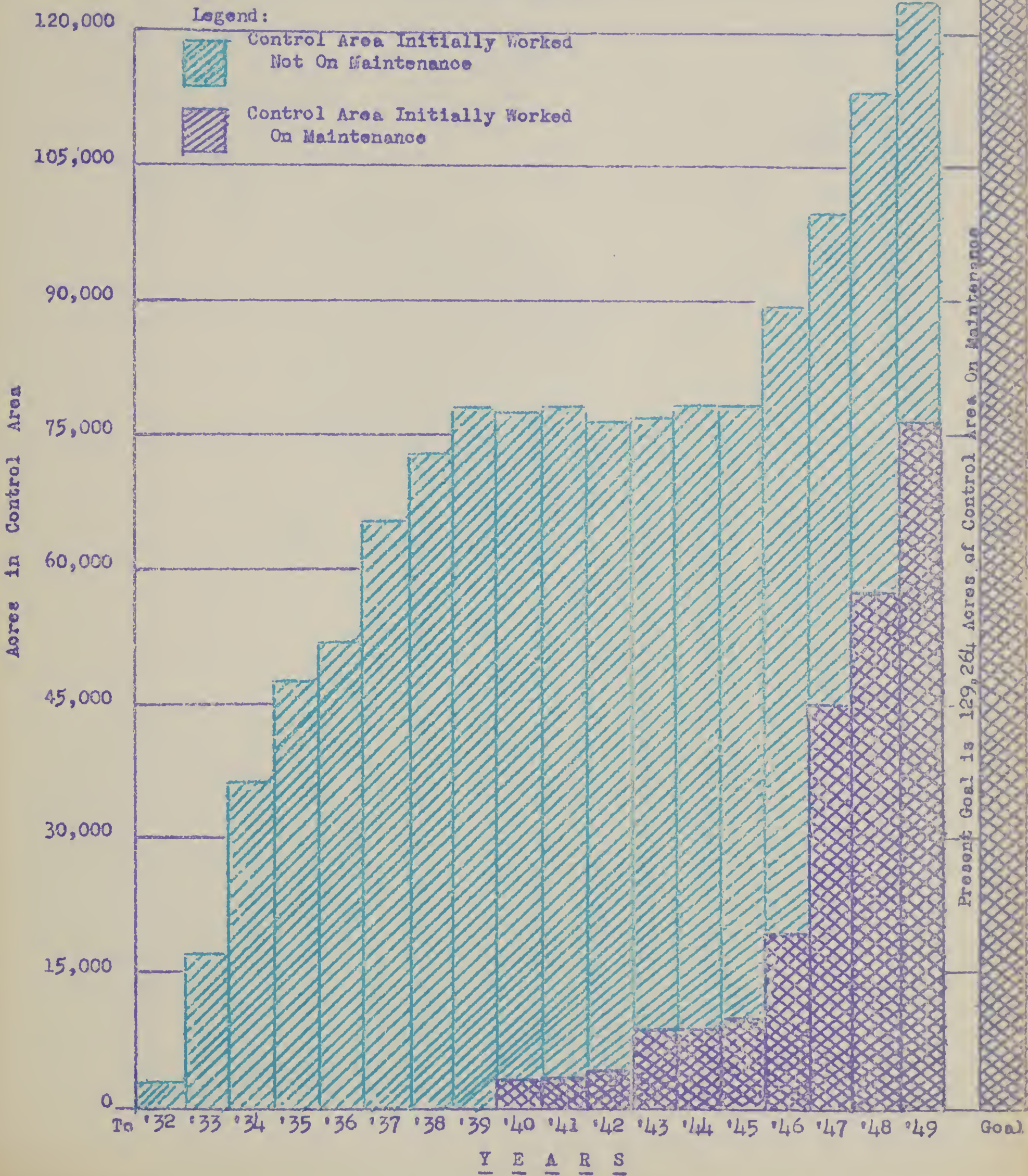


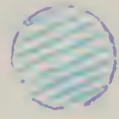
CHART 13

Status of Control by Indian Reservations

LEGEND:



WHITE PINE NOT PROTECTED

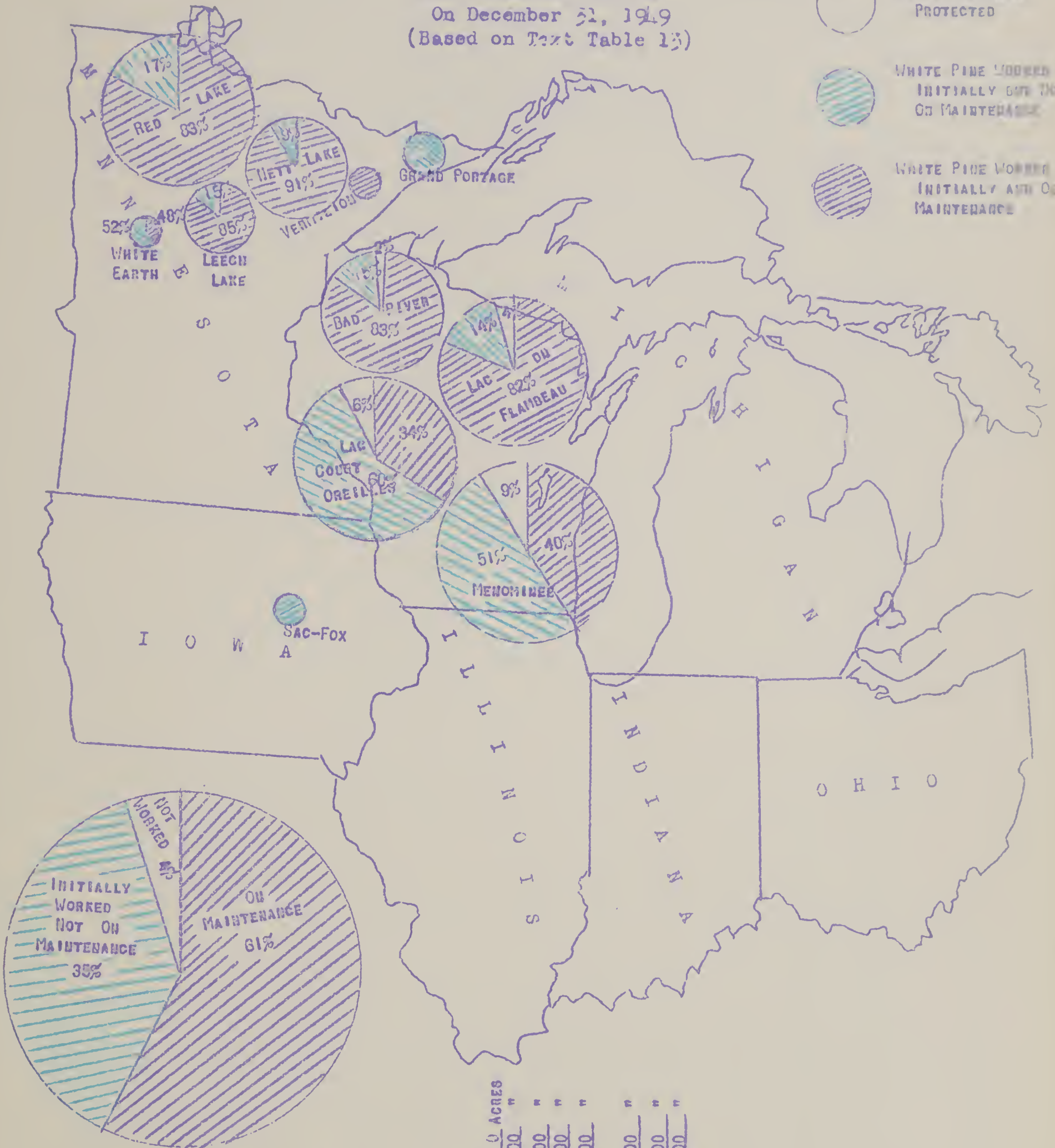


WHITE PINE WORKED INITIALLY BUT NOT ON MAINTENANCE

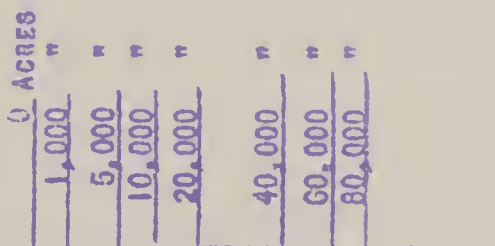


WHITE PINE WORKED INITIALLY AND ON MAINTENANCE

NORTH CENTRAL REGION
On December 31, 1949
(Based on Text Table 13)



TOTAL INDIAN SERVICE
WHITE PINE 75,898 ACRES
IN NORTH CENTRAL REGION



SCALE OF PINE ACRES
(RADIUS OF CIRCLE IN ACRES)

C H A R T 14

Number of Ribes Destroyed per Acre, All Workings,

By Indian Reservations

NORTH CENTRAL REGION
To December 31, 1949
(Based on Test Table 14)

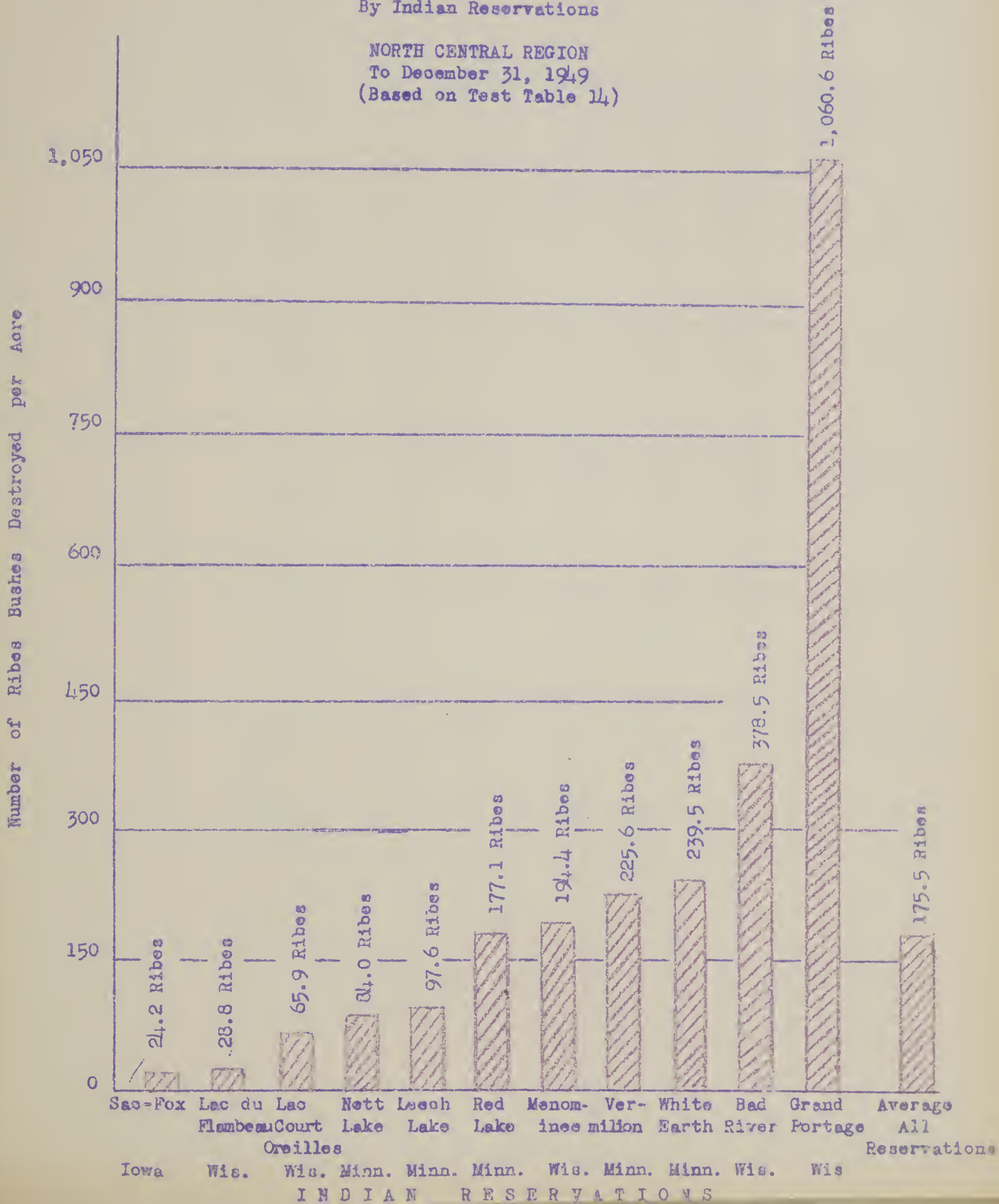


Table 1. Surveys Performed in North Central Region, 1949

State	Type of Survey	Areas Mapped			Acreage Increase			Acreage Decrease			Total Acres		
		Previously			White			White			Mapped, Net		
		Pine	Control	Area	Pine	Control	Area	Pine	Control	Area	White	Pine	Control
Illinois	Preeradication	-	-	-	8	26	-	-	-	-	8	26	1
	Post-Check	570	2,796	-	-	-	-	4	123	-	566	2,673	24
	Total	570	2,796	-	8	26	-	4	123	-	574	2,699	25
Indiana	Preeradication	-	-	-	266	1,693	-	-	-	-	266	1,693	3
	Resurvey	33	1,029	-	170	248	-	4	304	-	199	973	5
	Post-Check	603	3,933	-	325	784	-	8	373	-	920	4,344	10
Ohio	Total	636	4,962	-	761	2,725	-	12	677	-	1,385	7,010	13
	Preeradication	-	-	-	649	2,074	-	-	-	-	649	2,074	13
	Resurvey	327	4,410	-	103	65	-	76	2,797	-	354	1,678	11
Michigan	Post-Check	615	12,098	-	154	132	-	45	8,696	-	723	3,534	26
	Total	942	16,508	-	906	2,271	-	122	11,493	-	1,726	7,285	39
Minnesota	Preeradication	-	-	-	2,770	14,590	-	-	-	-	2,770	14,590	120
	Resurvey	2,047	11,595	-	350	790	-	848	6,686	-	1,549	5,699	35
	Post-Check	14,978	53,491	-	3,131	5,719	-	2,610	11,770	-	15,499	47,440	177
Wisconsin	Total	17,025	65,086	-	6,251	21,099	-	3,458	18,456	-	19,819	67,729	232
	Preeradication	-	-	-	1,657	2,937	-	-	-	-	1,657	2,937	72
	Resurvey	5,353	11,023	-	72	84	-	2,551	5,976	-	2,880	5,131	145
Region	Post-Check	13,871	22,570	-	275	574	-	1,998	4,263	-	12,118	18,881	468
	Total	19,200	33,593	-	3,004	3,591	-	4,549	10,239	-	16,655	26,949	615
	Preeradication	-	-	-	6,976	16,510	-	-	-	-	6,976	16,510	117
Region	Resurvey	4,849	32,658	-	266	28	-	1,518	12,727	-	3,597	19,959	71
	Post-Check	13,498	30,501	-	1,291	1,997	-	901	3,716	-	13,888	28,782	250
	Total	18,347	63,159	-	8,533	18,535	-	2,419	16,443	-	24,461	45,251	188
Region	Preeradication	-	-	-	12,326	37,830	-	-	-	-	12,326	37,830	326
	Resurvey	12,615	60,715	-	961	1,215	-	4,997	28,490	-	8,579	33,440	267
	Post-Check	44,105	125,289	-	5,176	9,206	-	5,567	28,941	-	43,714	105,654	965
Region Total		36,120	166,104	-	46,463	88,551	-	10,564	57,431	-	60,619	179,924	1,558

Table 2. Summary of Local Control by States and Operating Agencies,
North Central Region, 1949

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Rides Destroyed	Total 8-Hour Man-Days Used
			Natural	Planted			
Initial Working							
Illinois	Bureau-State	1	-	8	26	5,541	
Indiana	Bureau-State	23	-	822	3,135	2,900	
Iowa	Bureau-State	2	-	13	70	12,414	
Ohio	Bureau-State	42	-	661	3,493	23,077	
Michigan	Bureau-State	93	1,905	939	12,508	42,555	250
	Forest Service	15	460	314	774	31,749	326
Minnesota	Total	108	2,365	1,253	14,398	74,304	
	Bureau-State	5	93	55	332	27,048	153
	Forest Service	23	1,824	-	2,263	182,610	1,903
	Indian Service	6	270	-	670	9,831	105
Wisconsin	Total	34	2,187	55	3,265	219,489	
	Bureau-State	163	5,845	604	30,174	83,551	716
	Forest Service	2	254	-	397	11,876	124
	Indian Service	31	3,656	-	6,568	169,543	1,431
Region	Total	196	9,755	604	37,139	264,970	
	Bureau-State	339	7,843	3,102	48,737	197,040	1,306
	Forest Service	40	2,538	314	4,550	226,235	2,353
	Indian Service	37	3,926	-	7,238	179,374	1,536
Region Total, Initial		416	14,307	3,416	60,525	602,649	5,195

(Cont'd.)

Table 2. (Cont'd.) Summary of Local Control by States and Operating Agencies,
North Central Region, 1949

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used	
			Natural	Planted				
Second Working								
Illinois	Bureau-State	1	=	5	15	2,026		
Indiana	Bureau-State	8	=	444	2,485	259		
Iowa	Bureau-State	4	=	23	133	22,668		
Ohio	Bureau-State	62	=	621	2,035	1,350		
Michigan	Bureau-State	31	2,515	103	6,924	4,819		
	Forest Service	6	875	620	2,600	11,700	124	
Minnesota	Total	37	3,390	723	9,524	16,519	34	
	Bureau-State	8	500	53	937	92,413	637	
	Forest Service	6	405	166	703	17,809	454	
	Indian Service	15	855	11	1,661	215,251	1,308	
Wisconsin	Total	29	1,760	230	3,301	325,473	2,399	
	Bureau-State	35	1,605	201	7,196	133,707	1,134	
	Forest Service	4	730	-	1,221	11,156	230	
	Indian Service	9	1,897	13	3,301	198,208	1,055	
Region	Total	48	4,232	214	11,718	343,071	2,489	
	Bureau-State	149	4,620	1,450	19,728	257,240	2,000	
	Forest Service	16	2,010	786	4,524	40,665	816	
	Indian Service	24	2,752	24	4,962	413,459	2,363	
Region Total, Second		189	9,382	2,260	29,214	711,364	5,179	

(Cont'd.)

Table 2. (Cont'd) Summary of Local Control by States and Operating Agencies,
North Central Region, 1949.

State	Operating Agency	Number Area Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Quart Man-Days Used
			Natural	Planted			
Third and Subsequent Workings							
Illinois	Bureau-State	1	-	20	50	13,058	23
Indiana	Bureau-State	5	-	476	2,859	80	7
Iowa	Bureau-State	1	180	-	233	12,302	202
Ohio	Bureau-State	12	33	77	754	83	3
Michigan	Bureau-State	23	1,655	21	4,515	17,945	145
	Forest Service	17	3,703	1,254	8,485	36,265	852
	Total	40	5,358	1,275	13,000	54,210	993
Minnesota	Bureau-State	2	38	100	267	15,565	98
	Forest Service	8	-	527	742	15,406	502
	Indian Service	25	2,390	30	3,296	169,236	2,395
	Total	35	2,428	657	4,305	200,207	2,995
Wisconsin	Bureau-State	8	3,179	409	5,727	118,785	1,043
	Forest Service	4	1,368	1,360	4,389	182,337	1,939
	Indian Service	7	2,220	254	4,198	43,681	1,343
	Total	19	6,767	2,023	14,314	344,803	4,325
Region	Bureau-State	52	5,085	1,103	14,455	176,825	1,524
	Forest Service	29	5,071	3,141	13,616	234,008	3,293
	Indian Service	32	4,610	284	7,494	212,917	3,758
Region Total, Third and Subsequent		113	14,766	4,528	35,565	623,750	8,555

(Cont'd.)

Table 2. (Cont'd.) Summary of Local Control by States and Operating Agencies
North Central Region, 1949

State	Operating Agency	Number Areas Worked	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
			Natural	Planted			
All Workings							
Illinois	Bureau-State	3	-	33	91	80,627	34
Indiana	Bureau-State	36	-	1,442	5,418	7,239	67
Iowa	Bureau-State	7	180	36	456	16,391	139
Ohio	Bureau-State	126	33	1,659	7,265	24,464	132
Michigan	Bureau-State	147	6,075	1,063	23,947	65,319	497
	Forest Service	38	5,038	2,188	12,975	79,714	1,302
	Total	185	11,113	3,251	46,922	115,033	1,759
Minnesota	Bureau-State	15	631	208	1,536	135,026	886
	Forest Service	37	2,229	693	3,708	215,825	2,859
	Indian Service	46	3,515	41	5,627	394,318	3,808
	Total	98	6,375	942	10,871	715,169	1,553
Wisconsin	Bureau-State	206	10,629	1,214	43,097	336,043	2,893
	Forest Service	10	2,352	1,360	6,007	205,369	2,301
	Indian Service	47	7,773	267	14,067	411,432	3,829
	Total	263	20,754	2,841	63,171	952,844	9,023
Region	Bureau-State	540	17,548	5,655	82,920	631,105	4,830
	Forest Service	85	9,619	4,241	22,690	500,908	6,452
	Indian Service	93	11,288	308	19,694	805,750	7,637
Region Total: All Workings		718	38,455	10,204	125,304	1,937,763	18,919

Table 2A. Summary of Local Control by States and Ownership Classes
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used	
				Natural	Planted				
									Total
Initial Working									
Illinois	State & Private	Private	1	-	8	26	5,544	2	
	State & Private	Non-Fed. Public	1	-	90	150	-	1	
	State & Private	Private	22	-	432	1,984	2,900	31	
State Total			23	-	522	2,134	2,900	33	
Iowa	State & Private	Non-Fed. Public	1	-	7	25	6,161	23	
	State & Private	Private	1	-	6	45	6,253	23	
State Total			2	-	13	70	12,414	46	
Ohio	State & Private	Non-Fed. Public	5	-	311	1,325	22,002	78	
	State & Private	Private	47	-	650	2,168	1,029	21	
State Total			52	-	961	3,493	23,031	99	
Michigan	State & Private	Non-Fed. Public	13	695	221	1,937	19,091	77	
	State & Private	Private	71	1,085	443	9,216	23,044	170	
	Sub-Total			84	1,780	664	11,153	42,135	247
	Forest Service	Huron N.F.	3	-	335	390	201	6	
	Forest Service	Manistee N.F.	15	25	279	1,240	2,088	18	
	Forest Service	Marquette N.F.	1	275	275	550	8,011	54	
	Forest Service	Hiawatha N.F.	3	125	125	720	418	4	
Minnesota	State & Private	Ottawa N.F.	2	160	160	345	21,451	249	
	Sub-Total			24	585	989	3,245	32,169	331
	State Total		108	2,365	1,253	14,398	74,334	578	
	State & Private	Non-Fed. Public	1	40	40	40	46	17	
	State & Private	Private	4	53	55	292	27,002	136	
	Sub-Total			5	93	95	332	27,048	153
	Forest Service	Superior N.F.	16	1,596	-	1,912	121,527	1,856	
Forest Service	Chippewa N. F.	7	228	-	228	351	61,083	247	
	Sub-Total			23	1,824	2,263	182,610	1,902	
	Indian Service	Red Lake	6	270	-	670	9,831	105	
State Total			34	2,187	55	3,265	219,489	2,161	

(Cont'd)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Aores White Pine Protected		Aores Worked	Number Ribes Destroyed	Total	
				Natural	Planted			8-Leaf Man-Days Used	Total
Wisconsin	State & Private	Non-Ped. Public	6	885	109	994	1,753	50,253	401
		Private	157	4,960	495	5,455	28,421	33,298	315
	Sub-Total		163	5,845	604	6,449	30,174	83,551	716
	Forest Service	Chequamegon N.F.	2	254	-	254	397	11,875	126
	Indian Service	Lac Court Oreilles	12	1,095	-	1,095	2,142	128,942	762
		Lac du Flambeau	11	1,046	-	1,046	2,026	20,345	155
		Menominee	8	1,515	-	1,515	2,400	20,256	574
		Sub-Total	31	3,656	-	3,656	6,568	169,543	1,017
	State Total		196	9,755	604	10,359	37,132	254,978	1,277
Region	State & Private	Non-Ped. Public	27	1,620	738	2,358	5,230	97,553	597
		Private	303	6,098	2,089	8,187	42,152	99,067	744
	Sub-Total		330	7,718	2,827	10,545	47,382	196,620	1,341
	Forest Service	All Forests	49	2,663	589	3,252	5,905	226,655	1,378
	Indian Service	All Forests	37	3,926	-	3,926	7,233	179,374	1,378
		Initial	416	14,307	3,446	17,753	60,525	602,649	5,395

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
				Natural	Planted			
Second Working								
Illinois	State & Private	Private	1	-	5	15	2,024	5
	State & Private	Non-Fed. Public	2	-	304	1,065	30	4
	State Total	Private	6	-	140	420	229	4
			3	-	444	1,485	259	6
Iowa	State & Private	Non-Fed. Public	1	-	20	125	22,534	87
	State Total	Private	3	-	3	8	134	4
			4	-	23	133	22,668	91
	State & Private	Non-Fed. Public	5	-	55	200	24	2
Ohio	State Total	Private	57	-	566	2,838	1,326	26
			62	-	621	3,038	1,350	18
	State & Private	Non-Fed. Public	11	972	1,054	2,500	2,222	42
	State Total	Private	19	1,243	21	3,624	2,256	53
Michigan		Sub-Total	30	2,215	103	6,124	95	
Forest Service	Huron N.F.	2	240	-	510	843	18	
	Marquette N.F.	4	635	1,255	2,090	10,857	106	
	Hiawatha N.F.	1	300	-	800	341	4	
	Sub-Total	7	1,175	620	3,400	12,041	128	
Minnesota	State Total	37	3,390	723	4,113	16,519	223	
	State & Private	Non-Fed. Public	4	461	507	814	85,426	581
	State Total	Private	4	39	46	123	6,987	56
		Sub-Total	8	500	53	937	92,413	637
Forest Service	Superior N.F.	2	387	-	409	9,898	255	
	Chippewa N.F.	4	18	166	294	7,911	199	
	Sub-Total	6	405	166	703	17,809	454	
	Indian Service	Nett Lake	1	39	50	122	11,040	126
Red Lake		14	816	816	1,539	204,211	1,182	
Sub-Total		15	855	11	1,661	215,251	1,308	
State Total		29	1,760	230	3,301	325,473	2,399	

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	8-Month Man-De-fu Used
				Natural	Planted			
Second Working (Cont'd.)								
Wisconsin	State & Private	Non-Fed. Public	5	821	81	902	107,949	837
		Private	30	784	120	904	25,758	297
		Sub-Total	35	1,605	201	1,806	133,707	1,134
	Forest Service	Chequamegon N.F.	4	730	-	730	11,456	274
	Indian Service	Bad River	5	1,236	-	1,236	155,149	741
		Lac Court Oreilles	2	343	13	356	33,864	86
		Lac du Flambeau	1	138	-	138	27	1
		Menominee	1	180	-	180	9,168	224
		Sub-Total	9	1,897	13	1,910	198,208	1,053
	State Total			4,232	214	4,446	343,971	2,159
Region	State & Private	Non-Fed. Public	28	2,254	588	2,842	218,185	1,553
		Private	120	2,066	862	2,928	38,714	443
		Sub-Total	148	4,320	1,450	5,770	256,899	1,996
	Forest Service	All Forests	17	2,310	786	3,096	44,005	839
	Indian Service	All Forests	24	2,752	24	2,776	123,459	2,361
Region Total, Second			269	9,382	2,260	11,642	711,364	5,179

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total B-Mour Man-Days Used
				Natural	Planted			
Third and Subsequent Workings								
Illinois	State & Private	Private	1	-	20	50	13,058	23
	State & Private	Non-Fed. Public	2	-	418	2,247	45	5
	State Total	Private	3	-	58	612	35	2
			5	-	476	2,859	80	7
Iowa	State & Private	Non-Fed. Public	1	180	-	233	11,309	202
Ohio	State & Private	Private	12	33	77	754	83	5
	State & Private	Non-Fed. Public	6	403	21	1,076	13,776	80
		Private	17	1,252	-	3,439	4,169	66
	Sub-Total		23	1,655	21	4,515	17,945	146
Forest Service	Marquette N. F.		11	3,150	795	6,610	24,165	481
		Ottawa N.F.	6	553	459	1,875	12,100	371
	Sub-Total		17	3,703	1,254	8,485	36,265	852
	State Total		40	5,353	1,275	13,000	54,210	998
Minnesota	State & Private	Private	2	38	100	267	15,565	98
	Forest Service	Superior N.F.	6	-	482	660	11,568	464
		Chippewa N.F.	2	-	45	82	3,838	38
	Sub-Total		8	-	527	742	15,406	502
	Indian Service	Vermilion	2	45	45	63	1,427	67
		Nett Lake	3	202	204	239	27,677	405
Wisconsin	State & Private	Red Lake	20	2,143	28	2,994	140,132	1,923
		Sub-Total	25	2,390	30	3,226	169,236	2,325
	State Total		35	2,428	657	4,305	200,297	2,995
	State & Private	Non-Fed. Public	8	3,179	409	5,727	118,785	1,943
Forest Service	Chequamegon N.F.		2	1,368	210	2,759	140,538	1,455
		Nicolet N.F.	2	-	1,150	1,630	41,799	484
	Sub-Total		4	1,368	1,360	4,389	182,337	1,939
	Indian Service	Lac Court Oreilles	2	538	792	1,662	10,759	347
State Total	Lac du Flambeau		1	932	-	1,436	481	11
		Menominee	4	750	-	1,100	32,441	985
	Sub-Total		7	2,220	254	4,198	43,681	1,343
	State Total		19	6,167	2,923	14,314	344,803	4,325

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Acres	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total B-Bow Man-Days Used
				Natural	Planted			
Third and Subsequent Workings (Cont'd.)								
Region	State & Private	Non-Fed. Public	17	3,762	848	4,610	9,333	1,330
		Private	35	1,323	255	1,578	5,122	154
		Sub-Total	52	5,085	1,103	6,188	14,455	1,484
	Forest Service	All Forests	29	5,071	3,141	8,212	13,616	1,484
	Indian Service	All Forests	32	1,610	261	1,871	7,794	1,484
Region Total, Third & Subsequent			113	14,766	4,528	19,294	35,565	2,968
All Workings								
Illinois	State & Private	Private	3	-	33	33	20,623	34
	State & Private	Non-Fed. Public	5	-	812	812	3,462	10
		Private	31	-	630	630	3,016	37
Iowa	State Total		34	-	1,442	1,442	6,473	47
	State & Private	Non-Fed. Public	3	180	27	207	433	312
		Private	4	-	9	9	53	27
Ohio	State Total		7	180	36	216	6,791	330
	State & Private	Non-Fed. Public	10	-	366	366	1,525	80
		Private	116	33	1,293	1,326	5,760	53
Michigan	State Total		126	33	1,659	1,692	24,464	132
	State & Private	Non-Fed. Public	30	2,070	324	2,394	35,089	199
		Private	107	3,580	464	4,044	16,279	269
Sub-Total			137	5,650	780	6,434	64,553	331

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total 8-Hour Man-Days Used
				Natural	Planted			
Michigan (Cont'd.)	Forest Service	Huron N.F.	5	240	335	575	900	1,044
		Manistee N.F.	15	25	254	279	1,240	2,088
		Marquette N.F.	16	4,060	1,415	5,475	9,250	43,033
		Hiawatha N.F.	4	425	-	425	1,520	759
		Ottawa N.F.	8	713	459	1,172	2,220	33,551
		Sub-Total	48	5,463	2,463	7,926	15,130	80,475
	State Total		185	11,113	3,251	14,364	36,922	145,033
Minnesota	State & Private	Non-Fed. Public	5	501	46	547	854	85,472
		Private	10	130	162	292	682	49,554
		Sub-Total	15	631	208	839	1,536	135,026
	Forest Service	Superior N.F.	24	1,983	482	2,465	2,981	142,993
		Chippewa N.F.	13	246	211	457	727	72,832
		Sub-Total	37	2,229	693	2,922	3,708	215,825
	Indian Service	Vermilion	2	45	-	45	63	1,421
Wisconsin	State & Private	Nett Lake	4	241	13	254	361	38,717
		Red Lake	40	3,229	28	3,257	5,203	354,174
		Sub-Total	46	3,470	41	3,511	5,627	394,310
	State Total		98	6,375	242	7,317	10,871	745,169
		Non-Fed. Public	19	4,885	599	5,484	10,025	276,987
		Private	187	5,744	615	6,359	33,072	59,056
	Sub-Total		206	10,629	1,214	11,843	43,097	336,043
Forest Service	Chequamegon N.F.		8	2,352	210	2,562	4,377	163,570
		Nicolet N.F.	2	-	1,150	1,150	1,630	41,799
		Sub-Total	10	2,352	1,360	3,712	6,007	204,369

(Cont'd.)

Table 2A. (Cont'd.) Summary of Local Control by States and Ownership Classes,
North Central Region, 1949

State	Ownership Class	Forest	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	Total	
				Natural	Planted			Man-Used	Used
Wisconsin (Cont'd.)	Indian Service	Bad River	5	1,236	-	2,010	155,149	1,236	744
		Lac Court Oreilles	16	1,976	267	4,508	173,565	2,243	1,175
		Lac du Flambeau	13	2,116	-	3,814	20,853	2,116	167
		Menominee	13	2,445	-	3,735	61,865	2,445	1,743
		Sub-Total	47	7,773	267	14,067	411,432	8,040	3,639
Region	State Total		263	20,754	2,841	62,171	952,844	23,595	9,025
	State & Private	Non-Ped. Public	72	7,636	2,174	21,812	459,653	9,810	3,430
		Private	458	9,487	3,206	58,953	170,691	12,693	1,341
		Sub-Total	530	17,123	5,380	80,765	630,344	22,503	4,771
	Forest Service	All Forests	95	10,944	4,516	24,845	501,869	24,560	6,173
Region Total, All Workings	Indian Service	All Forests	93	11,288	308	19,691	805,750	21,596	7,817
			715	38,455	10,204	125,304	2,937,763	43,659	10,988

Table 3. Summary of Local Control by Ownership Classes and Operating Agencies,
North Central Region, 1949

Ownership Class	Operating Agency	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	3-Hour Man-Days Used
			Natural	Planted			
			Total				
Initial Working							
Non-Fed. Public Private	Bureau-State	27	1,620	738	2,358	5,230	97,553
	Bureau-State	303	6,090	2,089	8,179	19,067	704
Forest Service	Bureau-State	9	125	275	400	1,355	420
	Forest Service	40	2,538	314	2,852	4,550	226,235
Indian Service	Sub-Total	19	2,663	589	3,252	5,905	226,655
	Indian Service	37	3,926	-	3,926	7,238	179,374
All Ownerships	All Agencies	446	14,307	3,426	17,723	60,525	602,649
Second Working							
Non-Fed. Public Private	Bureau-State	26	2,254	588	2,842	7,249	218,195
	Bureau-State	120	2,066	862	2,928	11,679	38,714
Forest Service	Bureau-State	1	300	-	300	800	341
	Forest Service	16	2,010	786	2,796	4,524	40,665
Indian Service	Sub-Total	17	2,310	786	3,096	5,324	41,006
	Indian Service	24	2,752	24	2,776	4,968	413,159
All Ownerships	All Agencies	109	9,382	2,260	11,642	29,214	712,364
							5,179

(Cont'd.)

Table 3. (Cont'd.) Summary of Local Control by Ownership Classes and Operating Agencies,
North Central Region, 1949

Ownership Class	Operating Agency	Number of Areas	Acres White Pine Protected		Acres Worked	Number Ribes Destroyed	8-Hour Man-Days Used
			Natural	Planted			
			Total				
<u>Third & Subsequent Workings</u>							
Non-Fed. Public	Bureau-State	17	3,762	245	4,610	143,915	1,510
Private	Bureau-State	35	1,323	255	1,578	32,910	141
Forest Service	Forest Service	29	5,071	3,141	8,212	234,008	3,293
Indian Service	Indian Service	32	4,610	284	4,894	212,917	3,716
All Ownerships	All Agencies	113	14,766	4,528	19,294	623,750	8,555
<u>All Workings</u>							
Non-Fed. Public	Bureau-State	72	7,636	2,174	9,810	159,653	3,450
Private	Bureau-State	158	9,487	3,206	12,693	170,901	1,311
Forest Service	Bureau-State	10	425	275	700	761	9
	Forest Service	85	9,619	4,241	13,860	500,908	6,482
	Sub-Total	225	10,561	4,516	14,560	501,669	6,491
Indian Service	Indian Service	93	11,280	303	11,596	505,770	7,637
All Ownerships	All Agencies	718	38,455	10,204	48,659	1,937,767	18,919

Table 4. Results of Checking After Ribes Eradication by States and Ownership Classes,
North Central Region, 1949

Ownership Class	Number of Areas	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre						Percent Acres Showing FLS or Less per Acre After Eradication
		Acres Worked	Acres			Remaining After Eradication			Over 25.0 FLS			
			Strip Acres	Ribes Found Bushes	F.L.S.	Ribes per Acre Bushes	F.L.S.	Acres	F.L.S.	Acres		
Private	3	91	4.0	7	20.5	1.7	Illinois	5.1	91	-	-	100.0
Non-Fed. Private	2	2,247	22.0	3	11.0	0.1	Indiana	0.5	2,247	-	-	100.0
Private	3	138	2.8	4	23.0	1.4		8.2	105	33	-	100.0
Total	5	2,385	24.8	7	34.0	0.3		1.4	2,352	33	-	100.0
Non-Fed. Private	3	433	9.0	43	78.0	4.8	Iowa	8.7	433	-	-	100.0
Private	4	53	2.0	11	23.0	5.5		11.5	53	-	-	100.0
Total	7	486	11.0	54	101.0	4.9		9.2	486	-	-	100.0
Non-Fed. Private	2	411	6.0	2	10.0	1.4	Ohio	7.1	411	-	-	100.0
Private	39	2,859	53.1	56	182.0	1.1		3.4	2,693	166	-	100.0
Total	41	3,270	59.1	58	192.0	1.0		3.2	3,104	166	-	100.0
Non-Fed. Private	30	5,513	113.5	127	182.0	1.1	Michigan	1.6	5,513	-	-	100.0
Private	107	16,279	395.8	291	1,191.5	0.7		3.0	15,979	300	-	100.0
Forest Service	48	15,130	371.2	333	572.5	0.9		1.5	15,018	112	-	100.0
Total	105	36,922	680.5	751	2,946.0	0.8		2.2	36,510	412	-	100.0
Non-Fed. Private	5	854	35.2	132	192.8	-	Minnesota	-	713	-	141	83.4
Private	7	523	16.8	57	111.6	3.4		6.6	364	109	50	90.4
Forest Service	32	3,527	104.9	257	513.5	2.4		4.9	3,317	56	154	95.6
Indian Service	45	5,617	152.7	888	1,368.7	5.8		8.9	4,489	1,075	53	99.0
Total	89	10,521	309.6	1,334	2,186.6	4.3		7.0	8,603	1,240	398	96.2

Table 4. Results of Checking After Ribes Eradication by States and Ownership Classes,
North Central Region, 1949 (Cont'd.)

Ownership Class	Checking After Eradication				Classification of Worked Areas on Basis of Ribes F.L.S. per Acre Remaining After Eradication						Percent Acreage Showing 25 FLS or Less per Acre After Eradication
	Number of Areas	Acreage	Strip Acres	Ribes Bushes	Ribes Found F.L.S.	Ribes per Acre Bushes	F.L.S.	0.0-15.0 FLS		Acres	
								Acres	Acres		
Non-Fed. Public	17	9,775	182.0	562	823.1	3.1	4.5	9,547	228	-	100.0
Private	14	4,969	69.8	175	189.6	2.5	2.7	4,969	-	-	100.0
Forest Service	8	5,795	78.4	195	264.8	2.5	3.4	5,795	-	-	100.0
Indian Service	42	12,869	197.9	375	628.5	1.9	3.2	12,749	120	-	100.0
Total	81	33,408	528.1	1,307	1,906.0	2.5	3.6	33,060	348	-	100.0
Wisconsin											
Non-Fed. Public	59	19,233	367.7	869	1,296.9	2.4	3.5	18,864	228	141	99.2
Private	177	24,912	544.3	601	1,741.2	1.1	3.2	24,254	606	50	99.7
Forest Service	88	24,452	554.5	785	1,350.8	1.4	2.4	24,130	168	154	99.4
Indian Service	87	18,486	350.6	1,263	1,997.2	3.6	5.7	17,236	1,195	53	99.7
Region Total	411	87,083	1,617.1	3,518	6,386.1	1.9	3.5	84,486	2,199	398	99.5

Table 5. Control Area Permits, North Central Region, 1949

State	Season 1949	Number Applications Received	Number Control Area Permits Approved	Number Applications		Percent Applications Approved	Approximate Number Man-Days Used
				Rejected	: Voluntarily Cancelled by Applicant		
Michigan	Spring	218	167	17	34	76.6	7.0
Minnesota	Spring	92	78	4	10	84.7	10.0
	Fall	8	6	1	1	75.0	1.0
Ohio	Total	100	84	5	11	84.0	11.0
	Spring	31	22	9	0	71.0	0.5
Wisconsin	Fall	2	2	-	0	100.0	0.5
	Total	33	24	6	0	72.7	1.0
Region	Spring	254	254	0	0	100.0	3.7
	Fall	21	21	0	0	100.0	.3
Region	Total	275	275	0	0	100.0	4.0
	Spring	595	521	30	44	87.6	21.2
Region Total	Fall	31	29	1	1	93.5	1.8
	Total	626	550	31	45	87.9	23.0

Table 6. Status of Control by States and Districts
North Central Region, December 31, 1949
Net Acres

District	Acres Total Control Problem				Acres Initially Worked				Acres Not Initially Worked				Acres on Maintenance	
	Natural Planted		Total		Natural	Planted	Total	Control	White	Control	White	Control	White	
	Pine	White Pine	Pine	White Pine	Pine	Pine	Pine	Area	Pine	Area	Pine	Area		
Entire State	231	1,735	1,946	13,397	228	1,654	1,884	11,168	62	2,229	597			
Illinois														
Entire State	323	9,101	9,424	189,710	323	7,701	8,024	79,295	1,100	110,415	6,163			
Indiana														
Entire State	714	5,125	5,859	50,066	684	2,712	3,406	24,303	2,152	15,763	1,601			
Iowa														
Entire State	3,152	17,901	21,053	1,476,005	3,038	12,520	15,558	178,588	5,495	271,197	6,308			
Ohio														
Michigan														
L. Peninsula	187,677	61,663	249,340	845,487	179,374	58,166	237,540	775,090	11,800	70,397	93,604			
U. Peninsula	132,461	16,096	148,557	339,948	114,646	15,906	130,552	297,674	18,005	42,274	55,797			
Entire State	320,138	77,759	397,897	1,185,435	294,020	74,072	368,092	1,072,764	29,805	112,671	149,401			
Minnesota														
Central	76,590	4,048	80,638	237,167	61,875	3,468	65,343	184,371	15,295	52,796	20,928			
N. Eastern	87,601	4,145	91,827	146,664	37,576	4,146	41,722	58,828	50,105	87,836	13,422			
N. Western	73,053	4,482	77,535	175,780	55,285	4,027	59,312	129,185	18,223	46,595	27,615			
Entire State	237,244	12,676	250,000	559,611	194,736	11,641	206,377	372,384	83,623	187,227	61,965			
Wisconsin														
Eastern	174,650	19,707	194,357	664,926	153,923	18,988	172,911	573,925	21,446	91,001	61,936			
Western	234,692	16,972	251,664	719,338	205,728	15,417	221,145	634,447	30,519	156,891	125,888			
Entire State	409,342	36,679	446,021	1,384,264	359,651	34,405	394,056	1,208,372	51,965	247,892	187,824			
Region Total	971,224	160,976	1,132,200	3,920,408	812,633	144,739	957,372	2,954,876	174,003	953,611	114,009			

Table 7. Status of Control by States and Ownership Classes,
North Central Region, 1949

Net Acres

Ownership Class	Acres Total Control Problem					Acres Initially Worked					Acres Not Initially Worked			Acres on Maintenance		
	Natural		Planted		Total	Natural		Planted		Total	White		Control Area	White Control		
	White	Pine	White	Pine		White	Pine	White	Pine		White	Pine				
	White	Pine	White	Pine	White	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine	Area
Illinois																
Non-Fed. Public	197	912	1,109	6,203	192	910	1,102	6,089	7	114	543	1,089				
Private	34	803	837	7,194	34	748	782	5,079	55	2,115	54	1,031				
Total	231	1,715	1,946	13,397	226	1,658	1,884	11,168	62	2,229	597	2,120				
Indiana																
Forest Service	-	18	18	179	-	18	179	179	-	-	18	179				
Non-Fed. Public	99	2,713	2,812	18,395	99	2,660	2,759	17,049	53	1,346	2,479	13,945				
Private	224	6,370	6,594	171,136	224	5,023	5,247	62,067	1,347	109,069	3,866	44,217				
Total	323	9,101	9,424	189,710	323	7,701	8,024	79,295	1,400	110,415	6,363	58,162				
Iowa																
Indian Service	-	45	45	500	-	45	500	500	-	-	-	-				
Non-Fed. Public	348	218	566	3,433	348	217	565	3,413	1	20	11	58				
Private	366	4,882	5,248	46,133	316	2,480	2,796	30,390	2,452	15,743	1,590	18,793				
Total	714	5,145	5,859	50,066	664	2,742	3,406	34,303	2,453	15,763	1,601	18,851				
Ohio																
Forest Service	-	520	520	4,341	-	514	514	4,029	6	312	514	4,029				
Non-Fed. Public	797	6,008	6,805	55,550	796	4,454	5,250	40,847	1,555	14,703	1,495	14,251				
Private	2,355	11,373	13,728	396,114	2,242	7,552	9,794	133,712	3,934	262,402	4,299	66,507				
Total	3,152	17,901	21,053	456,005	3,038	12,520	15,558	178,588	5,495	277,417	6,308	84,787				
Michigan																
Forest Service	28,044	33,261	61,305	161,962	27,186	33,090	60,276	158,867	1,029	3,095	37,869	110,829				
Nat. Park Serv.	15	-	15	120	15	-	15	120	-	-	-	-				
Non-Fed. Public	98,461	30,604	128,865	309,865	95,369	29,249	124,618	291,970	4,247	17,895	55,139	130,099				
Private	193,618	14,094	207,712	713,488	171,450	11,733	133,183	621,807	24,529	91,681	56,393	209,797				
Total	320,138	77,959	397,897	1,185,435	294,020	74,072	368,092	1,072,764	29,805	112,671	149,401	450,725				

(Cont'd.)

Table 7. (Cont'd.) Status of Control by States and Ownership Classes,
North Central Region, 1949
Net Acres

Ownership Class	Acres Total Control Problem				Acres Initially Worked				Acres Not Initially Worked				Acres on Maintenance	
	Natural Planted		Total		Natural		Total		White		Control Area		White	
	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine	White	Pine
Minnesota														
Forest Service	82,135	5,569	87,704	143,465	34,196	5,569	39,765	60,760	47,939	82,705	16,638	27,549		
Indian Service	21,483	329	21,817	32,172	21,465	329	21,794	32,129	23	43	17,600	24,446		
Non-Fed. Public	47,606	6,441	54,047	112,274	53,197	5,408	58,605	75,084	15,442	37,190	12,790	24,270		
Private	86,095	337	86,432	271,700	65,878	335	66,213	204,411	20,219	67,289	14,967	36,201		
Total	237,324	12,676	250,000	559,611	154,736	11,651	166,387	372,384	83,623	187,227	61,595	112,149		
Wisconsin														
Forest Service	22,718	10,692	33,410	65,780	21,684	10,692	32,376	58,152	1,034	7,268	14,748	28,256		
Indian Service	53,364	672	54,036	96,592	50,060	672	50,732	89,566	3,304	7,027	29,106	52,202		
Non-Fed. Public	80,966	16,002	96,968	267,265	79,617	15,600	95,217	264,899	1,751	2,366	50,702	139,155		
Private	252,294	9,313	261,607	1,026,627	208,290	7,441	215,731	795,395	45,876	231,232	93,268	329,623		
Total	509,342	26,679	536,021	1,456,264	359,651	24,405	384,056	1,203,372	51,965	247,892	167,824	549,216		
Region														
Forest Service	132,897	50,060	182,957	375,727	83,066	49,883	132,949	282,347	50,008	93,380	69,787	170,842		
Indian Service	74,852	1,046	75,898	129,264	71,525	1,046	72,571	122,195	3,327	7,069	46,706	76,653		
Nat. Park Serv.	15	-	15	120	15	-	15	120	-	-	-	-		
Non-Fed. Public	228,474	62,698	291,172	772,985	209,618	58,498	268,116	699,351	23,056	73,634	123,159	322,960		
Private	534,986	47,172	582,158	2,632,392	448,434	35,312	483,746	1,852,861	98,412	779,531	174,437	706,360		
Region Total	971,224	160,876	1,132,200	3,910,438	812,658	114,739	927,397	2,956,874	174,807	953,614	414,039	1,278,110		

Table 8. Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres White Pine Protected	Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per		Average No. Ribes Destroyed Per Man-Day
						Ribes	Man-Days	
Illinois 1932-1949	Forest Service	1	50	-	-	-	-	-
	Non-Federal Public	2,555	8,636	1,139,265	2,843	131.9	0.33	401
	Private	784	11,370	365,838	1,036	32.2	0.09	353
	Total	3,340	20,056	1,505,103	3,879	75.0	0.19	388
Indiana 1933-1949	Forest Service	18	179	-	3	-	0.02	-
	Non-Federal Public	2,149	17,202	107,667	943	6.3	0.05	114
	Private	7,010	72,686	331,810	2,993	4.6	0.04	111
	Total	9,177	90,067	439,477	3,939	4.9	0.04	112
Iowa 1933-1949	Indian Service	45	500	13,462	169	26.9	0.34	80
	Non-Federal Public	612	4,056	643,157	5,951	158.4	1.46	108
	Private	2,753	34,418	2,908,516	21,085	84.5	0.61	138
	Total	3,410	38,974	3,565,135	27,205	91.5	0.70	131
Ohio 1933-1949	Forest Service	514	4,029	56	13	Trace	Trace	4
	Non-Federal Public	4,593	41,894	532,670	8,336	12.7	0.20	64
	Private	11,629	163,850	2,037,640	24,658	12.4	0.15	83
	Total	16,736	209,773	2,570,366	33,007	12.3	0.16	78
Michigan 1928-1949	Forest Service	59,848	165,851	6,032,837	31,599	36.4	0.19	191
	Nat'l. Park Service	15	120	13	-	0.1	-	-
	Non-Federal Public	138,276	417,657	21,056,036	89,580	50.4	0.21	235
	Private	239,483	746,185	38,328,099	159,172	51.4	0.21	241
Minnesota 1917-1949	Total	437,622	1,329,813	65,416,985	280,351	49.2	0.21	233
	Forest Service	43,936	83,800	9,540,479	43,857	113.8	0.52	218
	Indian Service	22,053	34,547	10,560,235	20,296	305.7	0.59	520
	Non-Federal Public	40,605	86,348	10,803,359	39,521	125.1	0.46	-
Private	70,375	220,053	31,130,531	63,966	141.4	0.29	487	
	Total	176,969	424,748	62,034,604	167,640	146.0	0.29	370

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Average Per Acre Worked		Total 8-Hour Man-Days	Average No. Ribes Destroyed Per Man-Day	
		White Pine Protected	Acres Worked		Ribes	Man-Days		Ribes	Per Man-Day
Initial Working (Cont'd.)									
Wisconsin 1920-1949	Forest Service	29,405	69,305	4,945,981	71.4	31,075	0.45	159	
	Indian Service	51,415	94,022	20,843,246	221.7	69,389	0.74	309	
	Non-Federal Public	99,166	291,461	11,457,657	39.3	48,599	0.17	236	
	Private	229,837	877,005	50,370,365	57.4	218,654	0.25	230	
	Total	409,823	1,231,793	87,617,249	65.8	367,717	0.28	230	
Region 1917-1949	Forest Service	133,722	323,214	20,519,353	63.5	106,547	0.33	193	
	Indian Service	73,513	129,069	31,416,943	243.4	89,854	0.70	350	
	Nat'l. Park Service	15	120	13	0.1	-	-	-	
	Non-Federal Public	287,956	867,254	45,739,811	52.7	195,773	0.23	234	
	Private	561,871	2,125,567	125,472,799	59.0	491,564	0.23	255	
Region Total, Initial		1,051,077	3,435,224	223,148,919	64.8	883,738	0.26	253	
Second Working									
Illinois 1936-1949	Non-Federal Public	1,903	7,104	560,537	79.0	2,150	0.30	261	
	Private	387	3,094	51,529	17.0	365	0.12	141	
	Total	2,290	10,198	612,066	80.0	2,515	0.25	261	
Indiana 1936-1949	Non-Federal Public	1,782	8,972	17,697	2.0	230	0.03	77	
	Private	2,288	12,698	74,741	5.9	814	0.06	92	
	Total	4,070	21,670	92,438	4.3	1,044	0.05	92	
Iowa 1936-1949	Indian Service	10	206	57	17.4	57	0.28	63	
	Non-Federal Public	348	2,203	351,500	159.5	2,343	1.06	150	
	Private	715	4,999	330,621	66.1	2,817	0.56	117	
Total		1,073	7,408	685,723	92.6	2,217	0.70	111	
Ohio 1936-1949	Non-Federal Public	2,240	19,490	323,083	16.6	7,254	0.37	45	
	Private	3,828	30,909	400,791	13.0	5,179	0.17	71	
	Total	6,068	50,399	723,874	14.4	12,433	0.25	58	

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres White Pine Protected	Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per		Average No. Ribes Destroyed Per Man-Day
						Acres Worked	Man-Days	
Second Working (Cont'd.)								
Michigan 1932-1949	Forest Service	27,923	64,710	1,099,828	10,565	17.0	0.16	104
	Non-Federal Public	42,808	113,540	2,404,160	15,389	21.2	0.14	156
	Private	87,674	249,706	4,678,612	28,912	18.7	0.12	162
	Total	158,395	427,956	8,182,600	54,866	19.1	0.13	149
Minnesota 1933-1949	Forest Service	16,956	26,882	1,468,634	12,131	54.6	0.45	121
	Indian Service	18,551	26,768	2,772,412	12,809	103.6	0.48	216
	Non-Federal Public	13,679	22,226	1,282,538	8,239	57.7	0.37	156
	Private	14,084	46,039	2,714,897	11,626	59.0	0.25	234
Wisconsin 1934-1949	Total	63,272	121,915	8,238,481	44,805	67.6	0.37	184
	Forest Service	26,944	48,314	1,032,389	12,928	21.4	0.27	80
	Indian Service	20,439	39,593	3,545,167	22,837	89.5	0.58	155
	Non-Federal Public	37,167	87,913	1,342,043	11,081	15.3	0.13	121
Region 1932-1949	Private	67,934	234,570	3,584,530	30,747	15.3	0.13	117
	Total	152,484	410,390	9,504,129	77,593	23.2	0.19	122
	Forest Service	71,815	139,906	3,600,851	35,624	25.7	0.25	98
	Indian Service	39,000	66,567	6,321,171	35,703	95.0	0.54	177
Region Total, Second	Non-Federal Public	99,927	261,448	6,281,558	46,686	24.0	0.18	135
	Private	176,910	582,015	11,835,731	80,460	20.3	0.14	147
Region Total, Second		387,652	1,049,926	28,039,311	198,473	26.7	0.19	141

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per Acre Worked		Average No. Ribes Destroyed Per Man-Day
		White Pine Protected	Acres Worked			Ribes	Man-Days	
Illinois 1940-1949	Non-Federal Public	1,904	7,669	458,350	2,868	59.8	0.37	160
	Private	872	5,003	88,694	664	18.0	0.13	133
	Total	2,776	12,672	547,044	3,532	43.9	0.28	153
Indiana 1941-1949	Non-Federal Public	1,029	5,437	14,829	217	2.7	0.04	69
	Private	305	3,392	10,244	54	3.0	0.02	190
	Total	1,334	8,829	25,073	271	2.8	0.03	91
Iowa 1940-1949	Non-Federal Public	456	1,217	104,130	1,110	85.6	0.91	94
	Private	31	363	22,935	209	63.2	0.57	110
	Total	487	1,580	127,065	1,319	80.4	0.83	94
Ohio 1940-1949	Non-Federal Public	1,231	3,762	6,137	280	1.6	0.07	22
	Private	1,873	11,348	163,984	2,141	14.5	0.19	77
	Total	3,104	15,110	170,121	2,421	11.3	0.16	89
Michigan 1937-1949	Forest Service	13,063	26,621	185,126	3,494	7.0	0.13	53
	Non-Federal Public	9,539	22,385	290,256	2,291	13.0	0.10	127
	Private	16,773	49,000	664,458	5,500	13.6	0.11	121
Minnesota 1937-1949	Total	39,375	98,006	1,139,840	11,285	11.6	0.13	101
	Forest Service	6,941	11,745	373,756	4,133	31.8	0.35	90
	Indian Service	13,734	19,492	1,770,417	11,380	91.0	0.58	156
Wisconsin 1938-1949	Non-Federal Public	4,268	5,378	296,874	2,064	55.2	0.38	144
	Private	678	1,806	119,931	760	66.4	0.42	150
	Total	4,946	7,184	416,805	2,824	65.7	0.40	146
Wisconsin 1938-1949	Forest Service	5,361	8,533	253,776	3,536	29.7	0.41	72
	Indian Service	7,818	14,226	734,348	6,583	51.6	0.46	112
	Non-Federal Public	6,880	12,182	383,651	3,569	31.5	0.29	107
Wisconsin 1938-1949	Private	5,252	15,934	124,341	1,048	7.8	0.07	119
	Total	25,311	50,875	1,496,116	14,736	29.4	0.29	108

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres		Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per Acre Worked		Average No. Ribes Destroyed Per Man-Day
		White Pine Protected	Acres Worked			Ribes	Man-Days	
Region	Third and Other Workings (Cont'd.)							
	Forest Service	25,365	46,899	812,658	11,163	17.3	0.24	73
	Indian Service	21,552	33,718	2,504,765	17,963	74.3	0.53	139
	Non-Federal Public	25,307	58,030	1,554,237	12,399	26.8	0.21	125
	Private	25,784	86,846	1,194,587	10,376	13.8	0.12	115
Region Total, Third and Other		98,008	225,493	6,066,247	51,901	26.9	0.23	117
All Workings								
Illinois 1932-1949	Forest Service	1	50	-	-	-	-	-
	Non-Federal Public	6,362	23,409	2,158,162	7,861	92.2	0.34	275
	Private	2,043	19,467	506,061	2,065	26.0	0.11	245
	Total	8,406	42,926	2,664,223	9,926	62.0	0.23	261
Indiana 1933-1949	Forest Service	18	179	-	3	-	0.02	-
	Non-Federal Public	4,960	31,611	140,193	1,390	4.4	0.04	101
	Private	9,603	88,776	416,795	3,861	4.7	0.04	108
	Total	14,581	120,566	556,988	5,254	4.6	0.04	106
Iowa 1933-1949	Indian Service	55	706	17,054	226	24.2	0.32	75
	Non-Federal Public	1,416	7,476	1,098,787	9,404	146.9	1.24	117
	Private	3,499	39,780	3,262,082	24,111	82.0	0.60	135
	Total	4,970	47,962	4,371,923	33,741	91.2	0.70	130
Ohio 1933-1949	Forest Service	514	4,029	56	13	Trace	Trace	4
	Non-Federal Public	8,064	65,146	861,890	15,870	13.2	0.24	54
	Private	17,330	206,107	2,602,415	31,978	12.6	0.16	81
	Total	25,908	275,282	3,464,361	47,861	12.6	0.17	72

(Cont'd.)

Table 8. (Cont'd.) Summary of Local Control by States, Workings and Ownership Classes,
From Inception to December 31, 1949 - North Central Region
Gross Acres

State	Ownership Class	Acres		Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days	Average per Acre Worked		Average No. Ribes Destroyed Per Man-Day
		White	Pine Protected				Ribes	Man-Days	
Michigan 1933-1949	Forest Service	100,824		257,182	All Workings (Cont'd.) 7,317,791	45,658	28.5	0.18	160
	Nat'l. Park Service	15		120	13	"	0.1	-	-
	Non-Federal Public	190,623		553,582	23,750,452	107,260	42.9	0.19	221
	Private	343,930		1,044,891	43,671,169	193,584	41.8	0.19	226
	Total	635,392		1,855,775	74,739,425	346,502	40.2	0.19	186
Minnesota 1917-1949	Forest Service	67,835		122,427	11,382,869	60,121	93.0	0.49	189
	Indian Service	54,338		80,807	15,103,064	44,485	186.9	0.55	340
	Non-Federal Public	58,552		113,952	12,382,771	49,824	108.7	0.44	249
	Private	85,137		267,898	33,965,359	76,352	126.8	0.28	445
	Total	265,862		585,086	70,814,063	230,782	124.0	0.30	186
Wisconsin 1920-1949	Forest Service	61,710		126,152	6,232,146	47,539	49.4	0.38	191
	Indian Service	79,672		147,841	25,122,761	98,809	169.9	0.67	254
	Non-Federal Public	143,213		391,556	13,183,351	63,249	33.7	0.16	206
	Private	303,023		1,127,509	54,079,236	250,449	48.0	0.22	216
	Total	587,618		1,722,058	98,617,494	460,046	55.0	0.26	214
Region 1917-1949	Forest Service	230,902		510,019	24,932,862	153,334	48.9	0.30	163
	Indian Service	134,065		229,354	40,242,879	143,520	175.5	0.63	280
	Nat'l. Park Service	15		120	13	-	0.1	-	-
	Non-Federal Public	413,190		1,186,732	53,575,606	254,858	45.1	0.21	210
	Private	764,565		2,794,428	138,503,117	582,400	49.6	0.21	238
Region Total, All Workings		1,542,737		4,720,653	257,254,477	1,134,112	54.5	0.24	227

Table 2A. Summary of Ribes Eradication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1949 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-hour Man-Days Used	Average Per Acre Worked Ribes	Average Per Acre Worked Man-Days	Average No. Ribes Destroyed Per Man-Day
<u>Illinois</u>							
Forest Service	Bureau-State	50	-	-	-	-	-
Non-Federal Public	Bureau-State	23,409	2,153,162	7,861	92.2	0.24	275
Private	Bureau-State	19,167	506,061	2,065	26.0	0.11	245
Total, State		42,926	2,664,223	9,926	62.0	0.23	267
<u>Indiana</u>							
Forest Service	Bureau-State	179	-	-	-	0.02	-
Non-Federal Public	Bureau-State	31,611	140,193	1,390	4.4	0.04	101
Private	Bureau-State	88,776	416,795	3,861	4.7	0.04	108
Total, State		120,566	556,988	5,251	4.6	0.04	106
<u>Iowa</u>							
Indian Service	Indian Service	706	17,054	226	24.2	0.32	75
Non-Federal Public	Bureau-State	7,476	1,098,787	9,404	146.9	1.24	117
Private	Bureau-State	39,780	3,262,082	24,111	82.0	0.60	135
Total, State		47,962	4,377,923	33,741	91.2	0.70	130
<u>Ohio</u>							
Forest Service	Bureau-State	4,029	56	13	Tree	Tree	4
Non-Federal Public	Bureau-State	62,116	801,890	15,879	12.2	0.24	51
Private	Bureau-State	206,307	2,602,415	31,278	12.6	0.16	81
Total, State		275,282	3,464,361	47,861	12.6	0.17	72

(Cont'd)

Table 8A. (Cont'd) Summary of Ribes Eradication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1949 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average Per Acre Worked		Average No. Ribes Destroyed Per Man-Day
					Ribes	Man-Days	
Forest Service	Michigan						
	Bureau-State	74,805	824,331	3,735	11.0	0.05	221
	Bureau-Intermingled	1,538	85,396	433	55.5	0.28	197
	Forest Service	180,839	6,408,064	41,490	35.4	0.23	154
	Sub-Total	257,182	7,317,791	45,658	28.5	0.18	160
National Park Service	Bureau-State	120	15		0.1		
Non-Federal Public	Bureau-State	553,580	23,750,152	127,240	42.9	0.13	221
	Bureau-State	1,022,204	43,425,150	192,035	42.5	0.19	226
	Bureau-Intermingled	21,842	238,517	1,524	10.9	0.07	157
	Forest Service	845	7,502	25	8.9	0.03	300
	Sub-Total	1,044,891	43,671,169	193,584	41.3	0.19	
Total, State		1,855,775	74,759,425	346,502	40.5	0.19	216
Forest Service	Minnesota						
	Bureau-State	20,855	2,415,503	7,125	115.8	0.34	339
	Forest Service	101,572	8,967,366	52,996	88.3	0.52	169
	Sub-Total	122,427	11,382,869	60,121	93.0	0.49	153
	Bureau-State	3,289	349,469	1,179	106.2	0.36	236
Indian Service	Indian Service	77,518	14,753,595	43,306	190.3	0.56	341
	Sub-Total	60,807	15,102,064	44,405	166.2	0.55	303
	Bureau-State	112,265	12,195,280	47,593	108.6	0.42	250
	Bureau-Intermingled	1,687	187,491	2,241	111.1	1.33	64
	Sub-Total	113,952	12,382,771	49,834	108.7	0.44	253
Non-Federal Public	Bureau-State	267,890	33,955,339	76,352	123.8	0.23	165
	Sub-Total	985,024	72,634,069	270,782	124.0	0.39	306
Total, State							

(Cont'd)

Table 5A. (Cont'd.) Summary of Ribes Predication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1949 = North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total 8-Hour Man-Days Used	Average No. Ribes Destroyed Per Man-Day	
					Average Per Acre Worked	
					Ribes	Man-Days
Wisconsin						
Forest Service	Bureau-State	19,556	503,553	2,994	25.7	0.15
	Bureau Intermingled	9,726	169,426	2,327	17.4	0.24
	Forest Service	96,870	5,559,167	42,218	57.4	0.44
	Sub-Total	126,152	6,232,146	47,529	49.4	0.38
Indian Service	Bureau-State	317,811	25,122,761	98,809	16.9	0.67
	Bureau-State	390,799	13,170,206	63,017	33.7	0.16
	Bureau-Intermingled	757	13,145	202	17.4	0.27
	Sub-Total	391,556	13,183,351	63,249	33.7	0.16
Private	Bureau-State	1,126,707	54,063,691	250,228	48.0	0.22
	Bureau-Intermingled	802	15,545	221	19.4	0.28
	Sub-Total	1,127,509	54,079,236	250,449	48.0	0.22
	Total, State	1,793,058	98,617,494	460,046	55.0	0.26
214						
Region						
Forest Service	Bureau-State	119,474	3,743,443	13,870	31.9	0.12
	Bureau-Intermingled	11,264	254,822	2,760	22.6	0.25
	Forest Service	379,281	20,934,597	136,704	55.2	0.36
	Sub-Total	510,019	24,932,862	152,334	48.9	0.20
Indian Service	Bureau-State	3,289	349,469	1,179	106.3	0.36
	Indian Service	226,065	39,893,410	142,341	176.5	0.63
	Sub-Total	229,354	40,242,879	143,520	175.3	0.63
	National Park Service	180	13	-	0.1	-
					270	
					92	
					153	
					164	
					296	
					280	
					280	

(Cont'd.)

Table 8A. (Cont'd.) Summary of Ribes Eradication, All Workings, by States, Ownership Classes, and Operating Agencies, 1917 to 1949 - North Central Region
Gross Acres

Ownership Class	Operating Agency	Gross Acres Worked	Number of Ribes Destroyed	Total		Average Per		Average No. Ribes Destroyed Per Man-Day
				8-Hour Man-Days Used	Ribes	Man-Days	Ribes	
Region (Cont'd.)								
Non-Federal Public	Bureau-State	1,184,288	53,374,970	252,415	45.1	0.21	211	
	Bureau-Intermingled	2,444	200,636	2,443	82.1	1.00	82	
	Sub-Total	1,186,732	53,575,606	254,858	45.1	0.21	210	
	Bureau-State	2,770,939	138,201,553	580,630	49.9	0.21	238	
Private	Bureau-Intermingled	22,644	254,062	1,745	11.2	0.08	146	
	Forest Service	845	7,502	25	8.9	0.03	300	
	Sub-Total	2,793,488	138,905,117	582,400	49.6	0.21	235	
Grand Total, Region		4,720,653	257,254,477	1,134,112	54.5	0.24	227	

Table 9. Summary of Nursery Sanitation Performed during 1949
North Central Region

Name and Ownership of Nursery	Operating Agency	Working	White Pine		Acres Protected	Acres Worked	Ribes		Man- Days Used
			Trees in Nursery				Destroyed All Wild		
Illinois									
State Tree Nursery	Bureau-State	Ninth	209,000		80	575	23		2
Ohio									
Northrup Nursery, Private	Bureau-State	First	4,000		1	193	-		1
Girard Bros. Nurs. Private	Bureau-State	First	To be seeded		10	212	-		1
Total			4,000		11	405	-		2
Michigan									
Chittenden Nursery, F. S.	Forest Service	Eleventh	3,246,000		70	830	10,296		49*
Minnesota									
Badoura Nursery, State	Bureau-State	Seventh	1,756,000		50	504	10,255		74
Wisconsin									
Griffith Nursery, State	Bureau-State	Tenth	7,110,000		95	541	21		5
Grand Total			12,325,000		306	2,855	20,595		132

* 34 Man-Days by Forest Service, 15 Man-Days by Bureau-State.

Table 10. Cultivated Black Currant Elimination during 1949
North Central Region

State	Found		Destroyed		Man-Days Used
	Plantings	Plants	Plantings	Plants	
Iowa	1	1	5	12	1
Michigan	3	6	3	6	26
Total	4	7	8	18	27

Table 11. Cumulative Cultivated Black Currant Elimination
to December 31, 1949. North Central Region

State	Number of Inspections	Found		Destroyed		Total Man-Days Used	Plantings Found per 1,000 Inspections
		Plantings	Plants	Plantings	Plants		
Illinois	48,067	532	4,171	60	761	*	11.1
Indiana	64,226	5	20	3	15	*	0.2
Iowa	318,600	1,611	7,331	1,606	7,310	6,531	5.1
Ohio	1,845,970	8,838	75,605	8,406	73,117	25,791	4.8
Michigan	981,715	14,931	147,849	14,864	147,195	40,139	15.2
Minnesota	211,664	3,261	23,309	3,261	23,309	12,001	15.4
Wisconsin	922,898	6,601	37,080	6,597	37,051	32,137	7.2
Region Total	4,393,140	35,779	295,365	34,797	288,758	116,599	8.1

* Work done in connection with other field activities.

Table 12. Federal Expenditures, Milwaukee Regional Office
Calendar Year 1949

Appropriation	Expenditure Class	Leadership and Coordination		Field Data	Total
71.14 January to June 1949	Salaries	\$ 14,338.33		\$1,500.00	\$15,838.33
	Non-Salaries	1,911.19		500.00	2,411.19
	Total	16,249.52		2,000.00	18,249.52
W-a.14 July to December 1949	Salaries	13,119.67		1,600.00	14,719.67
	Non-Salaries	904.01		400.00	1,304.01
	Total	14,023.68		2,000.00	16,023.68
Total	Salaries	27,458.00		3,100.00	30,558.00
	Non-Salaries	2,815.20		900.00	3,715.20
Grand Total		\$30,273.20		\$4,000.00	\$34,273.20

Table 12 A. North Central Region Expenditures, by State and Appropriation, Calendar Year 1949

Appropriation	Milwaukee							Total Region
	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Office
State Indirect Aid January to June	\$ 210.00	\$ 300.00	\$ 450.00	\$ 402.00	\$ 675.00	\$ 1,300.00	\$ 3,820.00	-
State Indirect Aid July to December	210.00	300.00	450.00	432.00	675.00	1,400.00	3,780.00	-
State Direct Aid January to June	2,332.77	3,073.87	598.39	312.80	5,830.53	3,569.21	8,691.16	-
State Direct Aid July to December	2,431.25	2,156.68	533.98	408.00	6,312.51	11,378.06	21,405.09	-
Sub-Total, State	5,244.02	5,830.55	2,037.37	1,554.80	13,493.04	17,647.27	37,695.25	-
Bureau 71.14 January to June	933.74	933.75	189.71	1,347.87	9,289.21	10,054.94	9,766.97	18,249.52
Bureau W-a.14 July to December	1,310.60	1,310.61	44.70	1,599.19	8,484.96	9,221.17	8,842.27	16,023.68
Bureau 73.14 January to June	11.20	507.79	1,830.72	4,662.76	4,864.02	3,800.38	7,117.32	-
Bureau W-e.14 July to December	63.59	441.43	1,909.43	2,332.83	3,210.00	4,047.06	6,137.32	-
Forest Service 74 January to June	-	-	-	-	6,519.63	16,346.89	9,354.52	-
Forest Service 74 July to December	-	-	-	-	10,813.55	33,760.78	14,823.97	-
Indian Service 77 January to June	-	-	-	-	-	21,888.38	18,245.40	-
Indian Service 77 July to December	-	-	-	-	-	10,982.00	10,693.79	-
Indian Service Tribal January to June	-	-	-	-	-	-	2,983.22	-
Indian Service Tribal July to December	-	-	-	-	-	-	3,600.90	-
Sub-Total, Federal	2,319.13	3,193.58	3,974.55	9,942.65	43,181.37	110,101.60	91,565.68	34,273.20
Sub-Total, All Funds January to June	3,547.71	4,815.41	3,068.82	6,725.43	27,178.39	56,959.80	59,978.59	18,249.52
Sub-Total, All Funds July to December	4,015.44	4,208.72	2,943.11	4,772.02	29,496.02	70,789.07	69,283.34	16,023.68
GRAND TOTAL	7,563.15	9,024.13	6,011.93	11,497.45	56,674.41	127,748.37	129,261.93	34,273.20

Table 12 B. Total North Central Region Expenditures, Classified by State and Activity,
Calendar Year 1949

(Includes \$34,273.20 Milwaukee Office costs prorated to States on basis of total Federal Expenditures in each State as follows: \$30,273.20 to "Leadership and Coordination," \$4,000 to "Other Field Data")

Activity	Illinois	Indiana	Iowa	Ohio	Michigan	Minnesota	Wisconsin	Region	Percent Each Activity
Leadership & Coordination	\$4,855.08	\$6,661.93	\$1,348.41	\$6,907.66	\$15,990.78	\$28,672.67	\$30,194.62	\$94,631.15	24.8
Local Control	928.34	1,093.20	4,800.32(a)	2,351.55	29,772.20	82,475.67	97,494.57(b)	218,915.85	57.3
Nursery Sanitation	49.62	=	300.00	159.00	417.89	1,014.00	=	1,940.51	0.5
Black Currant Elimination	=	=	=	=	536.14	=	=	536.14	0.1
Canker Pruning	=	20.00	77.20	=	237.02	1,371.93	=	1,706.15	0.5
Surveys	363.56	1,461.00	=	3,068.24	3,414.75	13,930.26	5,323.88	27,561.69	7.2
Other Field Data	1,674.55	200.00	=	313.00	11,892.63	14,575.34	8,108.06	36,763.58	9.6
All Activities	\$7,871.15	\$9,436.13	\$6,525.93	\$12,799.45	\$62,261.41	\$142,039.87	\$141,121.13	\$382,055.07	100.0

- (a) Includes \$1.20 as value of cultivated ribes destroyed.
(b) Includes \$59.00 as value of cultivated ribes destroyed.

Table 12 C. North Central Region Expenditures Classified by Appropriation
and Activity. Calendar Year 1949

Source of Funds	Class of Expenditures	Leadership and Co-ordi- nation			Black Nursery Sanita- tion			Canker Pruning		Surveys		Other Field Data		Total	Percent Each Source of Funds
		\$	-	\$	\$	-	\$	\$	-	%	-	\$	-	\$	
State Indirect Aid	Salaries	\$ 7,904.00	-	-	625.00	-	-	-	-	-	-	3,600.00	-	\$12,129.00	3.8
	Non-Salaries	-	-	-	75.00	-	-	-	-	-	-	2,200.00	-	2,275.00	
	Total	7,904.00	-	-	700.00	-	-	-	-	-	-	5,800.00	-	14,404.00	
State Direct Aid	Salaries	7,531.66	35,656.43	221.40	765.82	221.40	873.47	2,264.31	2,264.31	2,264.31	2,264.31	4,418.80	51,731.89		18.1
	Non-Salaries	8,305.80	5,406.69(a)	106.60	21.65	106.60	73.51	966.02	966.02	966.02	966.02	2,487.14	17,367.41		
	Total	15,837.46	41,063.12	328.00	787.47	328.00	946.98	3,230.33	3,230.33	3,230.33	3,230.33	6,905.94	69,099.30		
Bur. 71.14 and W-a. 14	Salaries	62,572.53	8,855.92	135.08	281.44	135.08	233.69	3,108.45	3,108.45	3,108.45	3,108.45	14,884.30	89,871.41		25.5
	Non-Salaries	4,908.19	764.42	14.20	24.30	14.20	12.44	570.14	570.14	570.14	570.14	1,437.79	7,731.48		
	Total	67,280.72	9,620.34	149.28	305.74	149.28	246.13	3,678.59	3,678.59	3,678.59	3,678.59	16,322.09	97,602.89		
Bur. 73.14 and W-a. 14	Salaries	2,478.60	16,736.84	-	35.00	-	120.83	3,523.19	3,523.19	3,523.19	3,523.19	1,767.51	24,661.97		10.7
	Non-Salaries	1,130.37	8,131.01	58.86	112.30	58.86	103.46	2,915.04	2,915.04	2,915.04	2,915.04	3,822.84	16,273.88		
	Total	3,608.97	24,867.85	98.86	147.30	98.86	224.29	6,438.23	6,438.23	6,438.23	6,438.23	5,590.35	40,935.85		
Forest Service 74	Salaries	-	76,627.28	-	-	-	-	9,004.08	9,004.08	9,004.08	9,004.08	963.46	86,594.82		24.0
	Non-Salaries	-	3,869.72	-	-	-	-	1,122.62	1,122.62	1,122.62	1,122.62	32.18	5,024.52		
	Total	-	80,497.00	-	-	-	-	10,126.70	10,126.70	10,126.70	10,126.70	995.64	91,619.34		
Indian Ser- vice 77 & Tribal	Salaries	-	57,619.41	-	-	-	210.00	3,281.30	3,281.30	3,281.30	3,281.30	1,085.09	62,195.80		17.9
	Non-Salaries	-	5,248.13	-	-	-	78.75	806.54	806.54	806.54	806.54	64.47	6,197.89		
	Total	-	62,867.54	-	-	-	288.75	4,087.84	4,087.84	4,087.84	4,087.84	1,149.56	68,393.69		
All Funds	Salaries	80,286.79	195,495.88	356.48	1,707.26	356.48	1,437.99	21,181.33	21,181.33	21,181.33	21,181.33	26,719.16	327,184.89		120.0
	Non-Salaries	14,344.36	23,419.97	179.66	233.25	179.66	268.16	6,380.36	6,380.36	6,380.36	6,380.36	10,044.42	54,870.18		
	Total	94,631.15	218,915.85	536.14	1,940.51	536.14	1,706.15	27,561.69	27,561.69	27,561.69	27,561.69	36,763.58	382,055.07		

(a) Includes \$60.20 as value of cultivated ribes destroyed.

Table 13. Approximate Number of Persons Employed by Months and Agencies,
North Central Region, 1949

Operating Agency	Number of Persons by Months												Average per Month
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Illinois													
State & Private	2.0	1.0	1.0	1.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	15.0
State & Private Bureau W-e. M4	1.0	1.0	1.0	1.0	1.0	1.0	-	1.0	1.0	1.0	1.0	1.0	12.0
Total	3.0	2.0	2.0	2.0	3.0	3.0	1.0	2.0	2.0	2.0	2.0	2.0	27.0
Indiana													
State & Private Bureau W-e. M4	1.0	1.0	1.0	1.0	1.0	1.0	-	1.0	1.0	1.0	1.0	1.0	12.0
Total	1.0	1.0	1.0	1.0	1.0	1.0	-	1.0	1.0	1.0	1.0	1.0	12.0
Iowa													
State & Private Bureau W-e. M4	1.0	1.0	1.0	1.0	1.0	1.0	-	1.6	1.3	1.0	1.0	1.0	13.4
Total	1.0	1.0	1.0	1.0	1.0	1.0	-	1.6	1.3	1.0	1.0	1.0	13.4
Ohio													
State & Private Bureau W-a. M4	1.0	1.0	1.0	1.0	1.0	1.0	-	2.0	2.0	2.0	2.0	2.0	18.0
Bureau W-e. M4	2.0	2.0	2.0	2.0	2.0	2.2	-	1.4	1.0	1.0	1.0	1.0	20.6
Total	3.0	3.0	3.0	3.0	3.0	3.2	-	3.4	3.0	3.0	3.0	3.0	42.6
Michigan													
State & Private Bureau W-a. M4	2.0	2.0	2.0	2.0	2.5	4.1	7.5	7.3	3.9	2.0	2.0	2.0	39.3
Bureau W-e. M4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0
Bureau W-e. M4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	12.0
Forest Service	-	-	-	-	1.7	7.0	13.4	36.1	1.6	-	-	-	59.8
Total	7.0	7.0	7.0	7.0	9.2	16.1	24.9	49.1	10.5	7.0	7.0	7.0	150.1
Minnesota													
State & Private Bureau W-a. M4	2.0	2.0	2.0	4.0	10.5	19.6	20.3	11.4	4.1	2.9	2.8	2.7	84.3
Bureau W-e. M4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0
Bureau W-e. M4	-	-	-	-	-	3.0	3.7	3.5	2.4	1.7	0.6	0.1	15.0

(Cont'd.)

Table 13. (Cont'd.) Approximate Number of Persons Employed by Months and Agencies
North Central Region, 1949

Operating Agency	Number of Persons by Months												Average per Month	
	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Total
Minnesota (Cont'd.)														
Forest Service 74	3.0	3.0	3.0	3.0	5.8	26.8	70.4	73.4	9.8	6.8	5.5	4.0	214.5	17.9
Indian Service 77	1.0	1.0	1.0	1.0	33.7	99.1	19.0	23.2	6.5	3.0	2.0	2.0	192.5	16.0
Total	10.0	10.0	10.0	12.0	54.0	152.5	117.4	115.5	20.8	10.4	14.9	12.0	554.3	16.2
Wisconsin														
State & Private	2.0	2.5	3.0	3.0	5.0	14.7	49.7	41.4	16.0	2.0	2.0	2.0	143.3	12.0
Bureau W-a. 14	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	48.0	4.0
Bureau W-e. 14	1.0	1.0	1.0	1.0	15.1	4.8	10.8	7.1	2.2	2.0	1.5	1.0	48.5	4.1
Forest Service 74	-	-	-	-	24.9	23.1	15.4	28.6	32.9	2.5	-	-	127.4	10.6
Indian Service 77	2.0	1.5	1.0	1.5	43.7	36.0	24.7	27.3	4.7	1.0	1.0	1.0	145.4	12.1
Indian Tribal	-	-	-	-	8.5	10.2	12.1	9.6	1.9	-	-	-	42.3	3.5
Total	9.0	9.0	9.0	9.5	101.2	92.8	116.7	118.0	61.7	11.5	8.5	8.0	554.9	16.1
Milwaukee														
Bureau K-a. 14	7.0	8.0	8.0	8.0	7.0	7.0	7.0	7.0	6.9	7.0	7.0	7.0	86.9	7.2
Total Region														
State & Private	8.0	8.5	9.0	11.5	24.1	42.6	82.4	64.4	26.5	9.3	8.8	8.7	303.8	25.4
Bureau W-a. 14	20.0	21.0	21.0	21.0	20.0	20.0	21.0	21.0	20.9	21.0	21.0	21.0	248.9	20.7
Bureau W-e. 14	5.0	5.0	5.0	5.0	19.1	12.0	19.0	15.3	8.5	6.8	5.1	4.1	109.9	9.2
Forest Service 74	3.0	3.0	3.0	3.0	32.4	56.9	99.2	138.1	44.3	9.3	5.5	4.0	401.7	33.5
Indian Service 77	3.0	2.5	2.0	2.5	77.4	135.1	43.7	50.5	11.2	4.0	3.0	3.0	337.9	28.1
Indian Tribal	-	-	-	-	8.5	10.2	12.1	9.6	1.9	-	-	-	42.3	3.5
Region Total	39.0	40.0	40.0	43.0	161.5	276.8	277.4	298.9	113.3	50.4	43.4	40.8	1,444.5	120.4

Table 11. Current and Cumulative Summary of Canker Pruning, from beginning to December 31, 1949, North Central Region

State	Years Worked	Number Areas Treated	Number Trees Examined	Number Trees Treated	Number Trees Removed	Number Cankers Removed	Number Man-Days Used
Indiana	1947-1948	2	800	2	0	4	0
	1949	2	173	6	0	7	1
	1947-1949	4	973	8	0	11	1
	1945-1948	35	30,287	551	630	1,789	43
Iowa	1949	10	10,270	122	81	160	9
	1945-1949	45	40,557	673	711	1,869	52
	1941-1947	5	1,306	44	13	126	15
Ohio	1933-1948	347	778,965	41,596	291	101,938	3,217
	1949	1	600	95	6	238	14
	1933-1949	348	779,565	41,691	297	102,176	3,231
Michigan	1933-1948	167	337,665	37,200	2,274	67,936	1,684
	1949	9	34,436	2,453	335	3,382	90
Minnesota	1937-1949	176	372,099	39,653	2,609	71,318	3,774
Wisconsin	1948	1	11,523	561	0	1,102	10
	1933-1948	557	1,160,544	79,954	3,208	172,815	4,969
Region	1949	22	45,479	2,676	122	3,787	114
Region Total	1933-1949	579	1,206,023	82,630	3,630	176,602	5,083

TABLE 1 - SHEET 1

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1949

NORTH CENTRAL REGION

State	Operating Agency	First Working					Second Working					Other Workings		
		Without Ribes Acres	With Ribes Acres	Total Acres	Destroyed Ribes	Man-Days	Acres	Destroyed Ribes	Man-Days	Acres	Destroyed Ribes	Acres	Destroyed Ribes	Man-Days
Illinois	Bureau-State	-	26	26	5,541	8	15	2,024	3	50	13,058			23
Indiana	Bureau-State	-	2,134	2,134	2,900	32	1,485	259	8	2,859	80			7
Iowa	Bureau-State	-	70	70	12,418	46	133	22,658	91	233	11,309			202
Ohio	Bureau-State	-	3,493	3,493	23,031	99	3,038	1,350	28	754	53			5
Michigan	Bureau-State	-	12,508	12,508	42,555	252	6,924	4,819	99	4,515	17,945			146
	Forest Service	-	1,890	1,890	31,749	326	2,600	11,700	124	8,485	36,265			852
	Total	-	14,398	14,398	74,304	578	9,524	16,529	222	13,000	54,210			948
Minnesota	Bureau-State	-	332	332	27,048	153	937	92,413	637	267	15,565			98
	Forest Service	-	2,263	2,263	182,610	1,903	703	17,809	454	742	15,405			502
	Indian Service	-	670	670	9,831	105	1,661	215,251	1,308	3,296	169,236			2,395
	Total	-	3,265	3,265	219,489	2,161	3,301	325,473	2,399	4,305	200,207			2,495
Wisconsin	Bureau-State	-	30,174	30,174	83,551	716	7,196	133,707	1,134	5,727	118,785			1,043
	Forest Service	-	397	397	11,876	124	1,221	11,156	238	4,389	182,337			1,939
	Indian Service	-	6,568	6,568	169,543	1,431	3,301	198,208	1,055	4,198	43,681			1,343
	Total	-	37,139	37,139	264,970	2,271	11,718	343,071	2,427	14,314	344,803			4,325
All States	Bureau-State	-	48,737	48,737	197,040	1,306	19,723	257,240	2,000	14,455	176,825			1,524
	Forest Service	-	4,550	4,550	226,235	2,353	4,524	40,665	816	13,516	234,008			3,293
	Indian Service	-	7,238	7,238	179,374	1,536	4,962	413,459	2,363	7,494	212,917			3,738
	Total	-	60,525	60,525	602,649	5,195	29,214	711,364	5,179	35,565	623,750			8,555

TABLE 1 - SHEET 2

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1949

NORTH CENTRAL REGION

A L L W O R K I N G S										
State	Operating Agency	Without Ribes Acres		Total Acres	Destroyed Ribes	Man-Days	Per Acre		Number of Camps	Total * Seasonal Employees
		Ribes Acres	Ribes				Man-Days			
Illinois	Bureau-State	-	91	91	20,623	34	226.6	0.37	-	4
Indiana	Bureau-State	-	6,478	6,478	3,238	47	0.5	0.01	-	2
Iowa	Bureau-State	-	486	486	46,391	319	95.5	0.70	-	5
Ohio	Bureau-State	-	7,235	7,235	24,464	132	3.4	0.02	-	8
Michigan	Bureau-State	-	23,947	23,947	65,319	497	2.7	0.02	-	11
	Forest Service	-	12,975	12,975	79,714	1,302	6.1	0.10	-	33
	Total	-	36,922	36,922	145,033	1,799	3.9	0.05	-	50
Minnesota	Bureau-State	-	1,536	1,536	135,026	888	87.9	0.58	-	80
	Forest Service	-	3,708	3,708	215,825	2,859	58.2	0.77	3	131
	Indian Service	-	5,627	5,627	394,318	3,808	70.1	0.68	-	91
	Total	-	10,871	10,871	745,169	7,555	68.5	0.69	3	302
Wisconsin	Bureau-State	-	43,097	43,097	336,043	2,893	7.8	0.07	-	35
	Forest Service	-	6,007	6,007	205,369	2,301	34.2	0.38	-	56
	Indian Service	-	14,067	14,067	411,432	3,829	29.2	0.27	-	69
	Total	-	63,171	63,171	952,844	9,023	15.1	0.14	-	160
All States	Bureau-State	-	82,920	82,920	631,105	4,830	7.6	0.06	-	152
	Forest Service	-	22,690	22,690	500,908	6,462	22.1	0.28	3	220
	Indian Service	-	19,694	19,694	805,750	7,637	40.9	0.39	-	160
Grand Total		-	125,304	125,304	1,937,763	18,929	15.5	0.15	3	532

* - Use Peak Season Employment

TABLE 1 - SHEET 3

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE - 1949

NORTH CENTRAL REGION

First Working

National Forests	First Working						Second Working				Other Workings				
	Without Ribes		With Ribes		Total Acres	Destroyed Ribes	Man-Days	Acres	Destroyed Ribes		Man-Days	Acres	Destroyed Ribes		Man-Days
	Acres	Ribes	Acres	Ribes					Acres	Ribes			Acres	Ribes	
Huron, Michigan	-	-	180	180	180	201	5	510	843	18	-	-	-	-	-
Manistee, Michigan	-	-	815	815	815	2,086	18	-	-	-	-	-	-	-	-
Marquette, Michigan	-	-	550	550	550	8,011	54	2,090	10,857	106	6,610	24,165	481	-	-
Ottawa, Michigan	-	-	345	345	345	21,451	249	-	-	-	1,875	12,100	371	-	-
Superior, Minnesota	-	-	1,912	1,912	1,912	121,527	1,656	409	9,898	255	660	11,568	464	-	-
Chippewa, Minnesota	-	-	351	351	351	61,083	247	294	7,911	199	82	3,838	38	-	-
Chequamegon, Wisconsin	-	-	397	397	397	11,876	124	1,221	11,156	238	2,759	140,538	1,455	-	-
Nicolet, Wisconsin	-	-	-	-	-	-	-	-	-	-	1,630	41,799	484	-	-
Total	-	-	4,550	4,550	4,550	226,235	2,353	4,524	40,665	816	13,616	234,008	2,291	-	-

TABLE 1 - SHEET 4

SUMMARY OF RIBES ERADICATION BY FOREST SERVICE - 1949

NORTH CENTRAL REGION

National Forests	ALL WORKINGS							Number of Camps	Total Seasonal Employees
	Without Ribes		Total Acres	Destroyed Ribes	Man- Days	Per Acre			
	Acres	Ribes				Ribes	Man- Days		
Kuran, Michigan	-	690	690	1,044	23	1.5	0.03	-	1
Manistee, Michigan	-	815	815	2,086	18	2.6	0.02	-	1
Marquette, Michigan	-	9,250	9,250	43,033	641	4.7	0.07	-	3
Ottawa, Michigan	-	2,220	2,220	33,551	620	15.1	0.28	-	22
Superior, Minnesota	-	2,981	2,981	142,993	2,375	48.0	0.80	3	105
Chippewa, Minnesota	-	727	727	72,832	484	100.2	0.67	-	26
Chequamegon, Wisconsin	-	4,377	4,377	163,570	1,817	37.4	0.42	-	33
Nicolet, Wisconsin	-	1,630	1,630	41,799	484	25.6	0.30	-	23
Total	-	22,690	22,690	500,908	6,462	22.1	0.28	3	227

* Use peak season employment

SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE - 1949

NORTH CENTRAL REGION												
Indian Lands	First Working				Second Working				Other Workings			
	Without Ribes		Total Acres	Destroyed Ribes	Man-Days	Destroyed Ribes		Man-Days	Destroyed Ribes		Man-Days	
	Acres	Ribes				Acres	Ribes		Acres	Ribes		
Nett Lake, Minnesota	-	-	-	-	-	122	11,040	126	239	27,677	405	
Vermilion, Minnesota	-	-	-	-	-	-	-	-	63	1,427	67	
Red Lake, Minnesota	-	670	670	9,831	105	1,539	204,211	1,182	2,994	140,132	1,923	
Bad River, Wisconsin	-	-	-	-	-	2,010	155,149	744	-	-	-	
Lac Court Oreilles, Wisconsin	-	2,142	2,142	128,942	742	704	33,864	86	1,662	10,759	347	
Lac du Flambeau, Wisconsin	-	2,026	2,026	20,345	155	352	27	1	1,436	481	11	
Menominee, Wisconsin	-	2,400	2,400	20,256	534	235	9,168	224	1,100	32,441	985	
Total	-	7,238	7,238	179,374	1,536	4,962	413,459	2,363	7,494	212,917	3,710	

TABLE 1 - SHEET 8

SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE - 1949

NORTH CENTRAL REGION

Indian Lands	All Workings			Per Acre		Number of Camps	Total * Seasonal Employees
	Without Ribes Acres	With Ribes Acres	Total Acres	Destroyed Ribes	Man- Days		
Nett Lake, Minnesota	-	361	361	38,717	531	107.2	1.47
Vermilion, Minnesota	-	63	63	1,427	67	22.7	1.06
Red Lake, Minnesota	-	5,203	5,203	354,174	3,210	68.1	0.62
Bad River, Wisconsin	-	2,010	2,010	155,149	744	77.2	0.37
Lac Court Oreilles, Wisconsin	-	4,508	4,508	173,565	1,175	38.5	0.26
Lac du Flambeau, Wisconsin	-	3,814	3,814	20,853	167	5.5	0.04
Menominee, Wisconsin	-	3,735	3,735	61,865	1,743	16.6	0.47
Total	-	19,694	19,694	808,750	7,637	40.9	0.39
							160

* Use peak season employment

TABLE 2 - SHEET 1

ACREAGE WORKED ON NATIONAL FOREST LANDS - 1949

NORTH CENTRAL REGION							
National Forests	First Working			Total Acres	Second Working Acres	Other Working Acres	All Working Acres
	Without Ribes Acres	With Ribes Acres					
Huron, Michigan	-	390		390	510	-	900
Manistee, Michigan	-	1,240		1,240	-	-	1,240
Marquette, Michigan	-	550		550	2,090	6,610	9,250
Hiawatha, Michigan	-	720		720	800	-	1,520
Ottawa, Michigan	-	345		345	-	1,875	2,220
Superior, Minnesota	-	1,912		1,912	409	660	2,981
Chippewa, Minnesota	-	351		351	294	82	727
Chequamegon, Wisconsin	-	397		397	1,221	2,759	4,377
Nicolet, Wisconsin	-	-		-	-	1,630	1,630
Total	-	5,905		5,905	5,324	13,616	24,845

TABLE 2 - SHEET 3

ACREAGE WORKED ON INDIAN LANDS - 1949

NORTH CENTRAL REGION					
Indian Lands	First Working		Total Acres	Second Working Acres	Other Working Acres
	Without Ribes Acres	With Ribes Acres			
Nett Lake, Minnesota	-	-	-	122	239
Vermilion, Minnesota	-	-	-	-	63
Red Lake, Minnesota	-	670	670	1,539	2,994
Bad River, Wisconsin	-	-	-	2,010	-
Lac Court Oreilles, Wisconsin	-	2,142	2,142	704	1,662
Lac du Flambeau, Wisconsin	-	2,026	2,026	352	1,436
Menominee, Wisconsin	-	2,400	2,400	235	1,100
Total	-	7,238	7,238	4,962	7,494
					19,694

TABLE 2 - SHEET 5

ACREAGE WORKED ON STATE AND PRIVATE LANDS - 1949

NORTH CENTRAL REGION					
State & Private Lands	First Working		Total Acres	Second Working Acres	Other Working Acres
	Without Ribes Acres	With Ribes Acres			
Illinois	-	26	26	15	50
Indiana	-	2,134	2,134	1,485	2,859
Iowa	-	70	70	133	283
Ohio	-	3,493	3,493	3,038	754
Michigan	-	11,153	11,153	6,124	4,515
Minnesota	-	332	332	937	267
Wisconsin	-	30,174	30,174	7,196	5,727
Total	-	47,382	47,382	18,928	14,455
					80,765

Calendar Year Series

TABLE 2 - SHEET 6

ACREAGE WORKED BY LAND OWNERSHIP - 1949

NORTH CENTRAL REGION

Land Ownership	First Working		Total Acres	Second Working Acres	Other Workings Acres	All Workings Acres
	Without Ribes Acres	With Ribes Acres				
National Forest	-	5,905	5,905	5,324	13,616	24,845
Indian Service	-	7,238	7,238	4,962	7,494	19,694
Total - Federal	-	13,143	13,143	10,286	21,110	44,525
State and Private	-	47,382	47,382	18,928	14,455	80,765
Grand Total	-	60,525	60,525	29,214	35,565	125,304

TABLE 3

Calendar Year Series

SUMMARY OF FIELD WORK OTHER THAN RIBES ERADICATION BY STATES AND OPERATING AGENCIES - 1949

NORTH CENTRAL REGION

State	Operating Agency	Ribes Nigrum		Nursery		Sanitation		Treatment of Diseased Pines	
		Destroyed Ribes	Man-Days	Number Nurseries	White Pine	Worked Acres	Destroyed Ribes	Man-Days	Treated Pines
Illinois	Bureau-State	-	-	2	209,000	575	23	2	-
Indiana	Bureau-State	-	-	-	-	-	-	-	-
Iowa	Bureau-State	12	1	-	-	-	-	-	6
Ohio	Bureau-State	-	-	-	-	-	-	-	122
Michigan	Bureau-State	-	-	2	4,000	405	-	2	-
	Bureau-State	6	26	-	-	-	-	-	-
	Forest Service	-	-	1	3,246,000	830	10,296	34	95
	Total	6	26	-	-	-	-	-	-
Minnesota	Bureau-State	-	-	1	3,246,000	830	10,296	49	95
Wisconsin	Bureau-State	-	-	1	1,756,000	504	10,255	74	2,453
All States	Bureau-State	-	-	1	7,110,000	541	21	5	-
	Forest Service	18	27	5	9,079,000	2,025	10,299	98	2,676
	Total	-	-	1	3,246,000	830	10,296	34	-
Grand Total		18	27	6	12,325,000	2,855	20,595	132	2,676

TABLE A

Accumulative Series - NET

STATUS OF RIBES ERADICATION BY STATES - ALL OWNERSHIPS, DECEMBER 31, 1949

NORTH CENTRAL REGION

State	Total Acres		Control Area (W.P. & Prot. Zone)		First Working		Second Working		Other Workings		On Maintenance		Remaining Work Requiring	
	White Pine	Acres	Acres	Zone	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Acres (Col. 14-6)
Illinois	1,946	13,397	11,168		10,198	83.4	12,672		2,272	17.0	2,229		2,229	8,896
Indiana	9,424	189,710	79,295		21,670	41.8	8,829		58,373	30.8	110,415		110,415	20,922
Iowa	5,859	50,066	34,303		7,408	68.5	1,530		18,851	37.7	15,763		15,763	15,152
Ohio	21,053	456,005	178,588		50,399	39.2	15,110		84,787	18.6	277,417		277,417	93,001
Michigan	397,897	1,185,435	1,072,764		427,956	90.5	98,006		450,719	38.0	112,671		112,671	622,049
Minnesota	250,000	559,611	372,384		121,915	66.5	38,421		112,468	20.1	187,227		187,227	259,916
Wisconsin	446,021	1,456,264	1,208,372		410,390	83.0	50,875		549,242	37.7	247,892		247,892	659,130
Total	1,322,200	3,910,488	2,936,874		1,049,936	75.6	225,493		1,276,712	32.6	953,614		953,614	1,680,163

TABLE B - SHEET 1

Accumulative Series - NET

STATUS OF RIBES ERADICATION ON NATIONAL FOREST LANDS, DECEMBER 31, 1949

NORTH CENTRAL REGION

National Forests		Control Area (W.P. & Prot. Zone)		First Working		Second Working		Other Workings		On Maintenance		Remaining Work Requiring	
State	Acres	Acres	Zone	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Acres (Col. 14-6)
Hoonier, Indiana	18	179		179	100.0					179	100.0		
Wayne, Ohio	520	4,341		4,029	92.8					4,029	92.8		
Huron, Mich.	1,853	6,293		6,263	99.5	2,138		128		4,246	67.5	312	2,017
Manistee, Mich.	22,620	70,430		70,430	100.0	14,734		5,458		67,965	96.5	30	2,465
Marquette, Mich.	11,639	25,710		25,710	100.0	14,035		8,400		13,395	52.1		12,315
Hiawatha, Mich.	15,439	36,181		34,381	95.0	16,481		3,590		17,923	49.5		16,458
Ottawa, Mich.	11,754	23,348		22,083	94.6	17,322		9,045		7,300	31.3	1,800	14,783
Superior, Mann.	74,521	116,899		38,923	33.3	16,541		9,528		11,849	10.1	1,265	27,074
Chippewa, Minn.	13,183	26,566		21,837	82.2	10,341		2,217		15,700	59.1	4,729	6,137
Chequamegon, Wis.	21,024	41,370		34,387	83.1	29,613		5,243		18,296	44.2	6,983	16,091
Nicollet, Wis.	12,386	24,410		24,125	98.8	18,701		3,290		9,960	40.8	285	14,165
Total	182,957	375,727		282,347	75.1	139,906		46,899		170,242	45.5	97,380	111,507

TABLE B - SHEET 2

Accumulative Series - NET

STATUS OF RIBES ERADICATION ON NATIONAL PARK LANDS, DECEMBER 31, 1949

NORTH CENTRAL REGION

National Park Lands	White Pine	Total Acres		Control Area (W.P. & Prot. Zone)		First Working		Second Working		Other Workings		Maintenance		Remaining Work	
		Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Unworked Acres	Requiring Rework Acres
Isle Royale, Mich.	15	120	100.0	-	-	-	-	-	-	-	-	-	-	-	120
Total	15	120	100.0	-	-	-	-	-	-	-	-	-	-	-	120

TABLE B - SHEET 3

Accumulative Series - NET

STATUS OF RIBES ERADICATION ON INDIAN LANDS, DECEMBER 31, 1949

NORTH CENTRAL REGION

Indian Lands	Acres	First Working		Second Working		Other Workings		Maintenance		Remaining Work	
		Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Acres	Per- cent	Unworked Acres	Requiring Rework Acres
Sac-Fox, Iowa	45	500	100.0	206	-	-	-	-	-	-	500
Grand Portage, Minn.	974	1,271	100.0	651	275	-	-	-	-	-	1,271
Leech Lake, Minn.	2,432	3,387	100.0	3,012	502	81.3	2,755	81.3	632	-	632
Hett Lake, Minn.	5,227	7,084	99.4	3,611	1,655	87.5	6,238	87.5	846	43	846
Vermilion, Minn.	78	186	100.0	206	435	100.0	186	100.0	-	-	-
White Earth, Minn.	502	1,056	100.0	918	808	51.6	545	51.6	511	-	511
Red Lake, Minn.	12,504	19,145	100.0	18,379	15,817	76.2	14,724	76.2	4,421	-	4,421
Bad River, Wis.	8,290	14,271	93.3	8,095	3,934	76.2	11,654	76.2	2,617	1,023	2,617
LacCourtOreilles, Wis.	13,803	25,000	92.8	7,517	3,000	36.8	9,210	36.8	13,992	1,798	13,992
LacduFlambeau, Wis.	11,375	21,351	95.3	6,304	1,436	84.6	18,068	84.6	2,283	1,000	2,283
Menominee, Wis.	20,568	34,947	90.8	17,597	5,796	38.0	13,270	38.0	18,172	3,205	18,172
Total	75,898	122,195	94.5	66,567	33,718	59.3	76,650	59.3	45,545	7,069	45,545

TABLE B - SHEET 5

Accumulative Series - NET

STATUS OF RUPES ERADICATION ON STATE AND PRIVATE LANDS, DECEMBER 31, 1949

NORTH CENTRAL REGION

State	Total Acres		First Working		Second Workings		Other Workings		On Maintenance		Remaining Work	
	White Pine	Control Area (W.P. & Proct. Zone)	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Unworked Acres	Requiring Remork Acres (Col. 12)
Illinois	1,946	13,397	11,168	83.4	10,198		12,672		2,272	17.0	2,229	8,896
Indiana	9,406	189,531	79,116	41.7	21,670		8,829		58,194	30.7	110,415	20,982
Iowa	5,814	49,566	33,803	68.2	7,202		1,580		18,851	38.0	15,763	14,982
Missouri	20,533	451,664	174,559	38.6	50,399		15,110		80,758	17.9	277,105	93,801
Michigan	336,577	1,023,353	913,777	89.3	363,246		71,385		339,890	33.2	109,576	573,187
Minnesota	140,479	383,974	279,495	72.8	68,265		7,184		60,471	15.7	104,479	219,024
Wisconsin	358,575	1,293,892	1,060,294	81.9	322,483		28,116		468,784	36.2	233,598	591,510
Total	873,330	3,405,377	2,552,212	74.9	843,463		244,876		1,029,220	30.2	853,168	1,882,924

TABLE B - SHEET 6

Accumulative Series - NET

SUMMARY OF STATUS OF RUPES ERADICATION BY LAND OWNERSHIP, DECEMBER 31, 1949

NORTH CENTRAL REGION

Land Ownership	Total Acres		First Working		Second Workings		Other Workings		On Maintenance		Remaining Work	
	White Pine	Control Area (W.P. & Proct. Zone)	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Acres	Per-cent	Unworked Acres	Requiring Remork Acres (Col. 12)
National Forests	182,251	515,721	282,367	75.1	142,904		16,800		170,202	45.9	98,500	111,707
National Parks	15	120	120	100.0								120
Private Lands	75,408	129,241	122,195	91.5	66,567		33,718		76,650	59.3	7,069	14,505
State Lands	228,810	205,110	102,682	50.1	20,173		20,607		21,147	10.0	100,445	157,111
State & Private Lands	873,330	3,405,377	2,552,212	74.9	843,463		244,876		1,029,220	30.2	853,168	1,882,924
Total	1,192,200	3,910,488	2,956,874	75.6	1,012,936		285,403		1,276,712	32.6	953,604	1,870,138

TABLE B - SHEET 7

Accumulative Series - K

STATUS OF RIBES ERADICATION ON INTERMINGLED LANDS, DECEMBER 31, 1949

NORTH CENTRAL REGION

Intermingled Lands	Total Acres		First		Second		Other		Maintenance		Remaining	
	Intermingled Lands		Working		Working		Workings		Per-		Requiring	
	Control Area (White Pine & Prot. Zone)	Acres	Per- cent	Acres	Acres	Acres	Acres	Acres	cent	Acres	Unworked Acres	Reworked Acres (Col. 1)
Michigan	134,332	126,700	94.3	48,365	9,950	43,391	32.3	7,632			83,309	
Minnesota	71,292	37,361	52.4	2,258	-	3,422	4.8	33,931			33,939	
Wisconsin	24,288	21,374	88.0	18,917	367	7,302	30.1	2,914			14,072	
Total	229,912	185,435	80.7	69,540	10,317	54,115	23.5	44,477			132,350	

TABLE C - SHEET 1

Accumulative Series - CROSS

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1949

NORTH CENTRAL REGION

FIRST WORKING

State	Operating Agency	Acres		Total Acres	Ribes Destroyed	Man-Days	SECOND WORKING		Man-Days
		Without Ribes	With Ribes				Acres	Ribes Destroyed	
Illinois	Bureau-State	2,680	17,376	20,056	1,505,103	3,879	10,198	612,066	2,505
	Bureau-State	38,977	51,130	90,067	439,177	3,939	21,570	92,438	1,005
	Bureau-State	-	38,474	38,474	3,551,673	27,036	7,202	682,131	5,160
	Indian Service	-	500	500	13,462	169	206	3,592	57
Total		-	38,974	38,974	3,565,135	27,205	7,408	685,723	5,217
Ohio	Bureau-State	49,354	160,419	209,773	2,570,366	33,007	50,393	723,874	12,405
	Bureau-State	-	1,231,145	1,231,145	60,206,001	232,498	369,223	7,151,522	44,598
	Forest Service	-	98,668	98,668	5,210,984	27,853	58,733	1,031,078	10,268
	Total	-	1,329,813	1,329,813	65,416,085	280,351	427,956	8,182,600	54,888
Minnesota	Bureau-State	-	324,054	324,054	44,552,758	110,682	73,737	4,104,613	20,834
	Forest Service	-	68,804	68,804	7,226,891	37,650	22,042	1,405,645	11,373
	Indian Service	-	31,890	31,890	10,254,955	19,328	26,136	2,728,223	12,598
	Total	-	424,748	424,748	62,034,604	167,660	121,915	8,238,481	44,805
Wisconsin	Bureau-State	-	1,184,913	1,184,913	62,263,170	259,564	335,318	5,164,404	44,838
	Forest Service	-	52,858	52,858	4,510,833	28,764	35,479	794,558	9,918
	Indian Service	-	94,022	94,022	20,843,246	69,389	39,593	3,545,167	22,637
	Total	-	1,331,793	1,331,793	67,617,249	357,717	410,390	9,504,129	77,393
All States	Bureau-State	90,971	3,007,511	3,098,482	175,088,548	700,585	867,747	18,531,048	131,422
	Forest Service	-	220,330	220,330	16,948,708	94,267	116,254	3,231,281	31,559
	Park Service	-	-	-	-	-	-	-	-
	Indian Service	-	126,412	126,412	31,111,663	88,886	65,935	6,276,982	55,492
Grand Total		90,971	3,354,253	3,445,224	223,148,919	883,738	1,049,936	28,039,311	198,473

TABLE C - SHEET 2

Accumulative Series - GROSS

SUMMARY OF RIBES ERADICATION BY STATES AND OPERATING AGENCIES 1918 - 1949

NORTH CENTRAL REGION												
State	Operating Agency	Other Workings				All Workings				Per Acre		
		Acres	Ribes Destroyed	Man-Days	Acres Without Ribes	Acres With Ribes	Total Acres	Ribes Destroyed	Man-Days	Ribes	Per Acre	
Illinois	Bureau-State	12,672	547,054	3,532	2,630	40,246	12,926	2,684,223	9,926			
Indiana	Bureau-State	8,829	25,073	271	30,937	81,629	120,565	556,988	5,290			
Iowa	Bureau-State	1,580	127,065	1,319	-	47,256	47,256	4,360,869	33,515	92.3	0.71	
	Indian Service	-	-	-	-	706	706	17,054	226	24.2	0.33	
Ohio	Total	1,580	127,065	1,319	-	47,962	47,962	4,377,923	33,741	91.3	0.30	
	Bureau-State	15,110	170,121	2,421	49,324	225,928	275,282	3,464,361	47,863	19.6	0.77	
Michigan	Bureau-State	73,723	966,336	7,891	-	1,674,091	1,674,091	68,323,859	304,987	40.8	0.18	
	Forest Service	24,283	173,504	3,394	-	181,684	181,684	6,415,566	41,515	35.3	0.24	
Minnesota	Total	98,006	1,139,840	11,285	-	1,855,775	1,855,775	74,739,425	346,502	19.7	0.14	
	Bureau-State	8,203	455,731	2,984	-	405,994	405,994	49,113,102	134,480	121.0	0.11	
	Forest Service	10,726	334,830	3,973	-	101,572	101,572	8,967,365	52,996	88.3	0.15	
	Indian Service	19,492	1,770,417	11,380	-	77,518	77,518	14,753,595	43,305	131.5	0.15	
Wisconsin	Total	38,421	2,560,978	18,337	-	585,084	585,084	72,824,061	230,781	20.5	0.12	
	Bureau-State	28,116	507,992	4,617	-	1,548,347	1,548,347	67,935,566	219,019	43.9	0.12	
	Forest Service	8,533	253,776	3,536	-	96,870	96,870	5,558,167	42,218	57.1	0.10	
	Indian Service	14,226	734,348	6,583	-	147,841	147,841	25,122,761	98,809	169.9	0.17	
All States	Total	50,875	1,486,116	14,736	-	1,793,053	1,793,053	28,617,494	460,016	55.0	0.10	
	Bureau-State	48,233	2,799,372	23,035	90,971	4,023,491	4,114,462	196,418,968	855,012	47.1	0.11	
	Forest Service	43,542	762,110	10,903	-	380,126	380,126	20,942,099	136,729	55.1	0.13	
	Park Service	-	-	-	-	-	-	-	-	-	-	
	Indian Service	33,718	2,504,765	17,963	-	226,065	226,065	39,893,410	442,341	176.5	0.18	
Grand Total		225,493	6,066,247	51,901	90,971	4,629,682	4,720,653	257,254,477	1,134,112	91.5	0.12	

TABLE C - SHEET 3

Accumulative Series - Gross

CUMULATIVE SUMMARY OF RIBES ERADICATION BY FOREST SERVICE 1918 - 1949

National Forests	NORTH CENTRAL REGION											
	First			Second			Third and Other			All Workings		
	Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days	Acres	Ribes Destroyed	Man- Days
Huron, Mich.	4,421	64,687	508	1,738	27,176	165	128	464	5	6,287	92,327	676
Manistee, Mich.	16,391	145,581	779	13,503	15,960	188	4,465	5,971	74	34,359	167,512	1,041
Marquette, Mich.	23,962	652,999	6,274	14,035	134,630	2,541	7,880	30,617	664	45,877	818,246	9,479
Hiawatha, Mich.	26,281	149,801	4,700	14,926	112,335	1,656	3,070	13,410	278	44,277	575,546	6,634
Ottawa, Mich.	27,613	3,897,916	15,592	14,531	740,977	5,718	8,740	123,042	2,373	50,884	4,761,935	23,683
Superior, Minn.	40,887	4,847,624	25,477	15,700	1,152,891	8,940	9,528	287,884	3,683	66,115	6,288,399	38,100
Chippewa, Minn.	27,917	2,379,267	12,173	6,342	252,754	2,433	1,198	46,946	290	35,457	2,678,967	14,895
Chequamegon, Wis.	29,549	2,427,198	15,665	19,806	507,540	6,265	5,243	176,995	2,333	54,598	3,111,733	24,263
Koololet, Wis.	23,309	2,083,635	13,099	15,673	287,018	3,653	3,290	76,781	1,203	42,272	2,447,434	17,955
Total	220,330	16,948,708	94,267	116,254	3,231,281	31,559	43,542	762,110	10,903	380,126	20,942,099	136,729

TABLE C - SHEET 5

ACCUMULATIVE SUMMARY OF RIBES ERADICATION BY INDIAN SERVICE 1918 - 1949

NORTH CENTRAL REGION

Indian Reservation	First Working			Second Working			Third and Other Workings			All Workings		
	Acres	Destroyed Ribes	Man- Days	Acres	Destroyed Ribes	Man- Days	Acres	Destroyed Ribes	Man- Days	Acres	Destroyed Ribes	Man- Days
Sac Fox, Iowa	500	13,462	169	206	3,592	57	-	-	-	706	17,054	226
Grand Portage, Minn.	1,620	2,367,154	4,525	651	289,501	1,064	275	43,546	267	2,546	2,700,201	5,856
Loech Lake, Minn.	1,648	326,352	732	2,380	153,271	620	502	90,689	376	4,530	570,312	1,728
Nett Lake, Minn.	7,126	527,722	1,841	3,611	321,890	2,604	1,655	191,757	1,735	12,392	1,041,369	6,180
Vermilion, Minn.	286	137,530	424	206	29,912	210	435	41,679	485	927	209,121	1,119
White Earth, Minn.	372	145,958	485	918	204,927	673	808	134,029	543	2,098	484,914	1,701
Red Lake, Minn.	20,838	6,750,239	11,321	18,370	1,728,722	7,427	15,817	1,268,717	7,974	55,025	9,747,678	26,722
Bad River, Wis.	14,673	8,216,882	18,888	8,095	1,371,517	5,735	3,994	541,738	2,397	26,762	10,130,137	27,020
LacCourtOreilles, Wis.	19,564	1,542,673	11,343	7,517	424,485	2,795	3,000	16,431	571	30,081	1,983,589	14,709
Lac du Flambeau, Wis.	20,448	766,676	4,301	6,384	46,470	371	1,436	481	11	28,268	813,627	4,683
Menominee, Wis.	39,337	10,317,015	34,857	17,597	1,702,695	13,936	5,796	175,698	3,604	62,730	12,195,408	52,397
Total	126,412	31,111,663	88,886	65,935	6,276,982	35,492	33,718	2,504,765	17,963	226,065	39,893,410	142,341

TABLE D - SHEET 1

ACCUMULATIVE SUMMARY OF GROSS ACREAGE WORKED ON NATIONAL FORESTS 1918 - 1949

National Forests	NORTH CENTRAL REGION				
	First Working		Total Acres	Second Working Acres	Other Workings Acres
	Without Ribes Acres	With Ribes Acres			
Shawnee, Illinois	50	-	50	-	50
Hoosier, Indiana	179	-	179	-	179
Wayne, Ohio	2,758	1,271	4,029	-	4,029
Huron, Michigan	-	6,856	6,856	2,138	9,122
Manistee, Michigan	-	70,432	70,432	14,734	90,624
Marquette, Michigan	-	27,487	27,487	14,035	49,922
Hiawatha, Michigan	-	31,651	31,651	16,481	51,722
Ottawa, Michigan	-	29,425	29,425	17,322	55,792
Superior, Minnesota	-	46,553	46,553	16,541	72,622
Chippewa, Minnesota	-	37,247	37,247	10,341	49,805
Chequamegon, Wisconsin	-	39,872	39,872	29,613	74,728
Nicolet, Wisconsin	-	29,433	29,433	18,701	51,424
Total	2,987	220,227	223,214	139,906	530,019

TABLE D - SHEET 2

ACCUMULATIVE SUMMARY OF GROSS ACREAGE WORKED ON NATIONAL PARKS 1918 - 1949

National Park	NORTH CENTRAL REGION				
	First Working		Total Acres	Second Working Acres	Other Workings Acres
	Without Ribes Acres	With Ribes Acres			
Isle Royale, Michigan	-	120	120	-	120

Accumulative Series - GROSS

TABLE D - SHEET 3

ACCUMULATIVE SUMMARY OF GROSS ACREAGE WORKED ON INDIAN LANDS 1918 - 1949

Indian Reservation	NORTH CENTRAL REGION				
		First Working		Total Acres	Second Working Acres
		Without Ribes Acres	With Ribes Acres		
Sac Fox, Iowa	-	500		500	206
Grand Portage, Minnesota	-	1,620		1,620	651
Leech Lake, Minnesota	-	3,323		3,323	3,012
Nett Lake, Minnesota	-	7,126		7,126	3,611
Vermilion, Minnesota	-	286		286	206
White Earth, Minnesota	-	1,354		1,354	918
Red Lake, Minnesota	-	20,838		20,838	18,370
Bad River, Wisconsin	-	14,673		14,673	8,095
Lac Court Oreilles, Wisconsin	-	19,564		19,564	7,517
Lac du Flambeau, Wisconsin	-	20,448		20,448	6,384
Menominee, Wisconsin	-	39,337		39,337	17,597
Total	-	120,060		120,060	66,667

TABLE D - SHEET 3

TABLE D - SHEET 3

TABLE D - SHEET 5

ACCUMULATIVE SUMMARY OF GROSS ACREAGE WORKED ON STATE AND PRIVATE LANDS 1918 - 1949

State	NORTH CENTRAL REGION				
	First Working		Total Acres	Second	
	Without Ribes Acres	With Ribes Acres		Working Acres	All Workings Acres
Illinois	2,630	17,376	20,006	10,198	12,672
Indiana	38,758	51,130	89,888	21,670	8,829
Iowa	-	38,474	38,474	7,202	1,580
Ohio	46,596	159,148	205,744	50,399	15,110
Michigan	-	1,163,842	1,163,842	363,246	71,385
Minnesota	-	306,401	306,401	68,265	7,184
Wisconsin	-	1,168,466	1,168,466	322,483	28,116
Total	87,984	2,904,837	2,992,821	843,463	144,876

TABLE D - SHEET 6

ACREAGE WORKED BY LAND OWNERSHIP 1918 - 1949

NORTH CENTRAL REGION				
Land Ownership	Without Ribes Acres	With Ribes Acres	Total Acres	Second Working Acres
National Forest	2,987	220,227	323,214	139,906
National Park	-	120	120	-
Indian	-	129,069	129,069	33,718
Subtotal - Interior	-	129,189	129,189	33,718
Total - Federal	2,987	129,410	452,403	66,567
State and Private	87,984	2,904,837	2,992,821	206,473
Grand Total	90,971	3,354,253	3,445,224	265,493

NORTH CENTRAL REGION

State	Operating Agency	Nursery Sanitation				Number		Treatment	
		Ribes		Nurseries Initially Protected	Worked Acres	Destroyed Ribes	Man-Days	Nurseries Still Active	Diseased Pine
		Destroyed	Nurseries						
Illinois	Bureau-State	761	-	3	2,520	50,401	300	4	-
Indiana	Bureau-State	15	-	6	3,750	11,351	60	2	8
Iowa	Bureau-State	7,510	6,531	9	3,436	67,106	324	7	673
Ohio	Bureau-State	73,117	25,791	16	7,021	60,615	1,912	7	44
Michigan	Bureau-State	117,195	40,139	8	2,734	284,850	6,164	6	41,691
	Forest Service	-	-	5	2,052	838,313	10,207	1	-
	Total	117,195	40,139	13	4,786	1,123,163	16,371	7	41,691
Minnesota	Bureau-State	23,309	12,001	17	6,308	1,335,438	5,091	6	37,547
	Indian Service	-	-	-	-	-	-	-	2,106
	Total	23,309	12,001	17	6,308	1,335,438	5,091	6	39,653
Wisconsin	Bureau-State	37,051	32,137	13	3,766	558,525	4,496	8	561
	Forest Service	-	-	3	1,154	128,753	3,655	1	-
	Indian Service	-	-	1	220	200,660	337	0	-
	Total	37,051	32,137	17	5,140	887,938	8,488	9	561
All States	Bureau-State	288,758	116,599	77	29,535	2,368,316	18,927	40	80,524
	Forest Service	-	-	8	3,206	967,066	13,862	2	-
	Indian Service	-	-	1	220	200,660	337	0	2,106
Grand Total		288,758	116,599	86	32,961	3,536,042	33,126	42	82,630

TABLE G

SUMMARY OF ALL RIBES ERADICATION BY STATES, OPERATING AGENCIES, AND PROGRAMS 1918 - 1949

State	Operating Agency	NORTH CENTRAL REGION						All Programs					
		Regular and Cooperative			All Emergency Programs			Destroyed			Ribes		
		Acrea	Ribes	Man-Days	Aores	Ribes	Man-Days	Aores	Ribes	Man-Days	Aores	Ribes	Man-Days
Illinois	Bureau-State	25,997	761,150	3,517	16,929	1,902,733	6,409	142,926	2,664,223	9			
Indiana	Bureau-State	60,350	136,962	832	59,636	420,826	4,422	120,566	556,988	5			
Iowa	Bureau-State	10,393	957,170	8,398	37,063	3,403,699	25,117	47,256	4,360,869	33			
	Indian Service	500	14,074	168	206	2,980	58	706	17,054	2			
	Total	10,693	971,244	8,566	37,269	3,406,679	25,175	47,962	4,377,923	33			
Ohio	Bureau-State	67,545	179,268	5,989	207,737	3,285,093	11,872	275,282	3,464,361	47			
Michigan	Bureau-State	418,698	5,721,750	32,630	1,255,393	62,602,109	272,357	1,674,091	68,323,859	304			
	Forest Service	84,452	1,207,724	12,772	97,232	5,207,842	28,743	181,684	6,415,566	41			
	Total	503,150	6,929,474	45,402	1,352,625	67,809,951	301,100	1,855,775	74,739,425	346			
Minnesota	Bureau-State	30,465	1,626,120	13,777	375,529	47,486,982	120,703	405,994	49,113,102	134			
	Forest Service	39,454	2,476,698	22,947	62,118	6,490,668	30,049	101,572	8,967,366	52			
	Indian Service	30,940	4,457,034	20,584	46,578	10,296,561	22,722	77,518	14,753,595	43			
	Total	100,859	8,559,852	57,308	484,225	64,274,211	173,474	585,084	72,824,063	210			
Wisconsin	Bureau-State	606,554	8,825,372	46,493	941,793	59,110,194	272,526	1,548,347	67,935,566	319			
	Forest Service	40,858	920,716	12,503	56,012	4,638,451	29,715	96,870	5,559,167	42			
	Indian Service	75,087	4,267,227	31,511	72,754	20,855,534	67,298	147,841	25,122,761	98			
	Total	722,499	14,013,315	90,507	1,070,559	84,604,179	369,529	1,793,058	98,617,494	460			
All States	Bureau-State	1,220,382	18,208,132	111,636	2,894,080	178,210,836	743,406	4,114,462	196,418,968	855			
	Forest Service	164,764	4,605,138	48,222	215,362	16,336,961	88,507	380,126	20,942,099	136			
	Indian Service	106,527	8,738,335	52,263	119,538	31,155,075	90,078	226,065	39,893,410	142			
	Total	1,491,673	31,551,605	212,121	3,228,980	225,702,872	921,991	4,720,653	257,254,477	1,133			



